EDF Energy Nuclear Generation Ltd

Decommissioning of Hinkley Point B Nuclear Power Station

Environmental Statement

Volume I: Main Text

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Introduction

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1 Introduction

1.1 Introduction

1.1.1. EDF Energy Nuclear Generation Limited (hereafter referred to as the 'Applicant') is seeking consent from the Office of Nuclear Regulation (ONR) to carry out the dismantling and decommissioning of the Hinkley Point B Nuclear Power Station (hereafter referred to as 'HPB') under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (hereafter referred to as 'EIADR') [1]. This Environmental Statement (ES) is submitted alongside the application and reports the process and conclusions of an Environmental Impact Assessment undertaken to assess the likely significant effects that may arise as a result of the proposed dismantling and decommissioning works at HPB.

1.1.2. If consented, the decommissioning works would include the dismantling and deconstruction of buildings and structures in areas within and outside of the Nuclear Site Licence (NSL) boundary that are part of the power station (the Proposed Works). To assist the identification of these areas for assessment, an Indicative Dismantling Works Area[2] (hereafter referred to as the 'Works Area') has been identified. For the purposes of assessment, the NSL boundary is referred to as the 'Site'. The Site and Works Area boundaries, and neighbouring Hinkley Point A (HPA) are shown in **Figure 1.1**. This ES has been prepared in accordance with the EIADR. A description of the other legislative and regulatory frameworks that this application interacts with, is presented in **Chapter 4: Policy and Legislation Overview**.

1.2 Overview of the Decommissioning Process and Proposed Works

1.2.1. HPB is a 1,320 MW twin Advanced Gas-Cooled Reactor (AGR) site which ceased generation in August 2022 after 46 years of service. Defueling commenced in September 2022 to remove spent fuel from the reactors equating to approximately 99% of the radioactivity from the Site which will allow the ONR to confirm the Site has reached 'Fuel-Free Verification' (FFV).

1.2.2. The Applicant's strategy, as discussed in **Chapter 2: The Decommissioning Process** and **Chapter 3: Alternatives**, for decommissioning HPB is to achieve 'Early Safestore', by enclosing the two reactors and debris vaults in a Safestore structure[3] and deferring dismantling of the associated infrastructure in the Safestore to a later date. To align with this strategy, the decommissioning process at HPB is planned to be delivered under three phases which are summarised as follows:

- **Preparations for Quiescence phase** – This phase includes the de-planting, dismantling and deconstruction of all plant and buildings that will not be included within the Safestore structure on-

[1] UK Government (1999). *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)* (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

[2] The Indicative Dismantling Works Area ('Works Area') defines the spatial extent within which all activities associated with Proposed Works will be undertaken, including deconstruction and decommissioning of buildings and infrastructure, the modification of the Reactor Building into the Safestore and construction of the Decommissioning Waste Processing Facility (DWPF) and Operational Waste Processing Facility (OWPF).

[3] Safestore is a high integrity, weatherproof, durable, readily-maintained, secure structure enclosing the two reactor vessels, the high activity debris vaults, and remaining plant and internal structures in the Reactor Buildings, Charge Hall, and associated structural during the Quiescence phase.

site and the relevant management of waste arisings. In addition, it includes the modification of the existing reactor building to construct the Safestore structure.

- **Quiescence phase** – A period of relative inactivity with the Site maintained in a mainly quiescent state to allow further radioactive decay of materials within the Safestore. The duration of this phase is approximately 70 years, with the Site under a regime of continuous monitoring and surveillance, with periodic care and maintenance.
- **Final Site Clearance** – The Safestore structure will be dismantled and the reactors and debris vaults will be dismantled and removed. Construction and engineering works to prepare for these Final Site Clearance tasks will take place to ensure the provision of the necessary infrastructure, services and facilities. Upon clearance and delicensing of the Site, the land will be released for future re-use.

1.2.3. A more comprehensive description of the Proposed Works is presented in **Chapter 2: The Decommissioning Process**.

1.3 The Applicant

1.3.1. At the time that this ES will be submitted, EDF Energy Nuclear Generation Limited (the Applicant) is the current Licensee holding the Nuclear Site Licence for HPB granted under the Nuclear Installations Act 1965 (as amended). The Applicant is making this application as the current Licensee (as defined in the EIADR) and in accordance with obligations under the Nuclear Site Licence (Licence Condition 35) to make and implement adequate arrangements for the decommissioning of HPB.

1.4 The Applicant and the Nuclear Decommissioning Authority

1.4.1. In 2021, the UK Government and the Applicant agreed revised arrangements to deliver the decommissioning of the seven Advanced Gas Cooled Reactor (AGR) stations, including HPB. Under the revised arrangements, the AGR stations, including HPB, will transfer to the Nuclear Decommissioning Authority (NDA) following End of Generation and the removal of all fuel from the reactors and fuel ponds (FFV stage). The transfer of the AGR stations from the Applicant to the Nuclear Decommissioning Authority will be subject to regulatory approvals, with Nuclear Restoration Services (NRS) (a subsidiary of the NDA and formerly known as Magnox Ltd) applying to become the Licensee and holder of the Nuclear Site Licence for each of the AGR sites. Thereafter, the NDA and NRS will become the responsible parties for implementing the decommissioning programmes.

1.4.2. In light of NRS being the responsible party for delivering the majority of the decommissioning works consented by this EIADR, it is important to highlight that the Applicant and NRS have worked collaboratively to inform the decommissioning strategy at the AGR sites, including HPB. A review of synergies that could be realised at HPB considering NRS delivery and the adjacent site at HPA has been undertaken and has led to changes to the original HPB decommissioning proposals, to take advantage of this where relevant. In addition, synergy groups have been set-up between the Applicant and NRS to share learning from decommissioning at other UK nuclear sites to help develop the Applicant's decommissioning proposals as they become more detailed.

1.5 The project team

1.5.1. This ES has been prepared on behalf of the Applicant by WSP UK Limited.

1.5.2. Regulation 5(2)a of the EIADR[1] states that the ES "*shall be prepared by a competent person and state the relevant expertise and qualifications of that person*". **Appendix 1A** presents the Competent Experts and Competency Statement provided by the Applicant.

1.5.3. WSP is registered with the Institute of Environmental Management and Assessment (IEMA)'s Environmental Impact Assessment (EIA) Quality Mark scheme. The scheme allows organisations that lead the co-ordination of EIAs in the UK to make a commitment to excellence in their EIA activities and have this commitment independently reviewed.

1.6 Environmental Impact Assessment

1.6.1. An Environmental Impact Assessment (EIA) is a tool for systematically examining and assessing the impacts and effects of proposed works or a development of a specific size or nature on the environment. The aim of the EIA is to identify any likely significant effects which may arise from the proposed works or a development and identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects. During the EIA process, alternatives are considered, and opportunities and management measures are identified and incorporated within the proposals, to prevent or reduce any adverse effects and to enable construction principles to be embedded within the proposals, further detail is provided in **Chapter 3: Alternatives**.

1.6.2. This ES forms the written reporting of the EIA carried out on behalf of the Applicant. Regulation 5(1) of the EIADR[1] requires that an EIA is undertaken and an ES is submitted with the application for consent.

1.6.3. The EIA assesses the likely significant effects of the Proposed Works on the environment and identifies the measures to mitigate the likely significant effects where required.

1.6.4. The EIADR do not define specific significance criteria with respect to the evaluation of likely significant effects. Therefore, the overall approach that has been taken to defining significance of effects, as well as further information about the approach to preparing this ES, is presented in **Chapter 5: Approach to EIA**.

1.6.5. In accordance with good practice, a Scoping Report for the Proposed Works was prepared, to identify the potential environmental effects associated with the Proposed Works at the time that the Scoping Report was prepared. Of these effects, those that were considered at the time to be likely significant effects, were proposed for further assessment in the EIA, whereas those that were not, were not proposed to be considered further.

1.6.6. The Scoping Report was issued to the ONR on 05 October 2022, with a request for the ONR to provide its written opinion as to the scope and level of detail of information proposed to be provided within this ES, under Regulation 6(1) of the EIADR. The ONR consulted with the statutory consultation bodies (as per Regulation 2 of the EIADR) and other relevant consultation bodies, where it was deemed appropriate by the ONR.

1.6.7. Drawing on the ONR Pre-application Opinion (see **Appendix 5A**), which was adopted on 07 December 2022, assessment work, as presented in this ES, has been informed by technical engagement with statutory consultation bodies and other stakeholder engagement. This ES includes the relevant environmental information to identify and assess the likely significant environmental

effects of the Proposed Works. In response to specific points raised in the ONR Pre-application Opinion (see **Appendix 5A**), responses are provided in a Technical Note submitted to the ONR in advance of the application being submitted (see **Appendix 5B**) to clarify the scope of the EIA prior to the submission of the ES.

1.7 Purpose of the Environmental Statement

1.7.1. Regulation 5(1) of the EIADR sets out the information that is reasonably required to assess the environmental effects of the Proposed Works, which an applicant is required to compile.

1.7.2. The information that is required to be included in an ES is set out in Regulation 5(1) as shown below in **Table 1-1**.

Table 1-1 – Regulation 5(1) ES requirements

Regulation 5(1) ES requirement	Relevant chapter
"a) a description of the project comprising information on the site, design, size and other relevant features of the project;	**Chapter 2: The Decommissioning Process**
b) a description of the likely significant effects of the project on the environment;	Environmental aspect **Chapter 6 – 20**
c) a description of any features of the project or measures envisaged to avoid, prevent or reduce and, if possible, offset, any likely significant adverse effects on the environment;	Environmental aspect **Chapter 6 – 20**
d) a description of the reasonable alternatives studied by the licensee, which are relevant to the project and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the likely significant effects of the project on the environment;	**Chapter 3: Alternatives**
e) a non-technical summary of the information referred to in sub-paragraphs (a) to (d); and	**Non-Technical Summary (NTS)**
f) any further information specified in Schedule 1 relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected."	Environmental aspect **Chapter 6 – 20**

1.8 Structure of this Environmental Statement

1.8.1. This ES comprises:

- Volume I: ES Main Chapters – (This volume) presents the main body of the EIA, including the description of the Site and the Proposed Works; a review of reasonable alternatives; an outline of the EIA process; and the EIA assessment which is divided into a number of environmental aspect chapters.
- Volume II: ES Figures – Figures to illustrate the Proposed Works and any assumptions, or to support the environmental aspect chapters.
- Volume III: ES Technical Appendices – Additional reports and survey data which provide further detail on the environmental aspect assessments undertaken and information used to inform the assessments presented in Volume I.
- Volume IV: Non-Technical Summary (NTS) – provides a standalone summary of the Proposed Works and the findings of the ES in non-technical language.

1.8.2. The remainder of this volume of the ES is structured as follows:

- **Chapter 2: The Decommissioning Process** provides a description of the Proposed Works.
- **Chapter 3: Alternatives** provides a review of key alternatives considered for the delivery of HPB decommissioning.
- **Chapter 4: Policy and Legislation** provides an overview of the principal legislation, policies and guidance that are relevant to the Proposed Works.
- **Chapter 5: The Approach to Environmental Impact Assessment** details the overarching approach and methodology that has been adopted to inform the technical assessment of each environmental aspect in this ES.
- **Chapters 6 - 20** present the technical assessments for each environmental aspect and define likely significant environmental effects which may arise as a result of the Proposed Works. Environmental measures and mitigation are identified where appropriate.
- **Chapter 21: Cumulative Effects Assessment** presents the assessment of cumulation of effects with other existing or approved projects or effects in combination with other environmental aspects, on the same receptor or receptor group.
- **Chapter 22: Summary** provides a summary of the likely significant effects for each of the environmental aspects.

1.8.3. The glossary and abbreviation list can be found in **Appendix 1B**.

1.9 Other applications

1.9.1. The EIADR allow for consent to be granted by the ONR to commence decommissioning activities. Parallel consenting regimes to the EIADR will be required to deliver specific elements of the Proposed Works, such as the proposed waste facilities.

Town and Country Planning Act 1990

1.9.2. The EIADR does not negate the need for planning permission should new development be required to facilitate decommissioning works and consent may be required under the Town and Country Planning Act[4].

1.9.3. Studies are ongoing to confirm whether waste generated from the Proposed Works during the Preparations for Quiescence phase will require new waste facilities on site to manage materials generated during the decommissioning process or whether existing buildings could be used or refurbished.

1.9.4. For the purposes of the EIADR assessment, to ensure a worst-case assessment has been considered, it has been assumed that both the Decommissioning Waste Processing Facility (DWPF) and the Operational Waste Processing Facility (OWPF) will be necessary on site, and the construction, operation and decommissioning of these facilities has been considered within the EIA. Further details of the proposed facilities are provided in **Chapter 2: The Decommissioning Process**.

1.9.5. In addition to the application to the ONR for consent to decommission HPB under the EIADR, consent for new buildings, structures or engineering work may be required from Somerset Council under the Town and Country Planning Act 1990. If new waste processing facilities are required, a planning application will be submitted in due course.

The Marine and Coastal Access Act 2009

1.9.6. The Marine and Coastal Access Act 2009[5] defines arrangements for a system of marine management, including the introduction of marine planning, across the UK. The Marine Management Organisation (MMO) is the licensing authority for England and is responsible for granting licences.

1.9.7. During the Preparations for Quiescence phase, marine structures associated with the operation of HPB will be decommissioned. The Proposed Works are likely to require a marine licence (in addition to the EIADR consent).

1.9.8. The MMO will be consulted in advance of the commencement of marine works to ensure necessary licences are in place. The current assumption is that the marine licence application will draw on the EIADR application (ES, Habitats Regulation Assessment (HRA) and other supporting documentation), thereby ensuring consistency in approach and impact assessment.

[4] UK Government (1990) Town and Country Planning Act 1990 (online). Available at: Town and Country Planning Act 1990 (legislation.gov.uk) (Accessed August 2024)

[5] UK Government (2009). The Marine and Coastal Access Act 2009. Available at: Marine and Coastal Access Act 2009 (legislation.gov.uk). (Accessed August 2024).

1.10 Other documents

1.10.1. Documents that are provided to support this ES include:

- Hinkley Point B EIADR Consultation Feedback Report;
- outline Environmental Management Plan; and
- a Habitats Regulations Assessment Screening document (to accord with Regulation 4A of the EIADR)[1].

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The Decommissioning process

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2 The decommissioning process

2.1 Introduction

2.1.1. This chapter provides a description of the Hinkley Point B Nuclear Power Station (HPB), the Indicative Dismantling Works Area ('the Works Area') and its surroundings, and a description of the Proposed Works and the main activities to be undertaken in each phase of the decommissioning project at HPB.

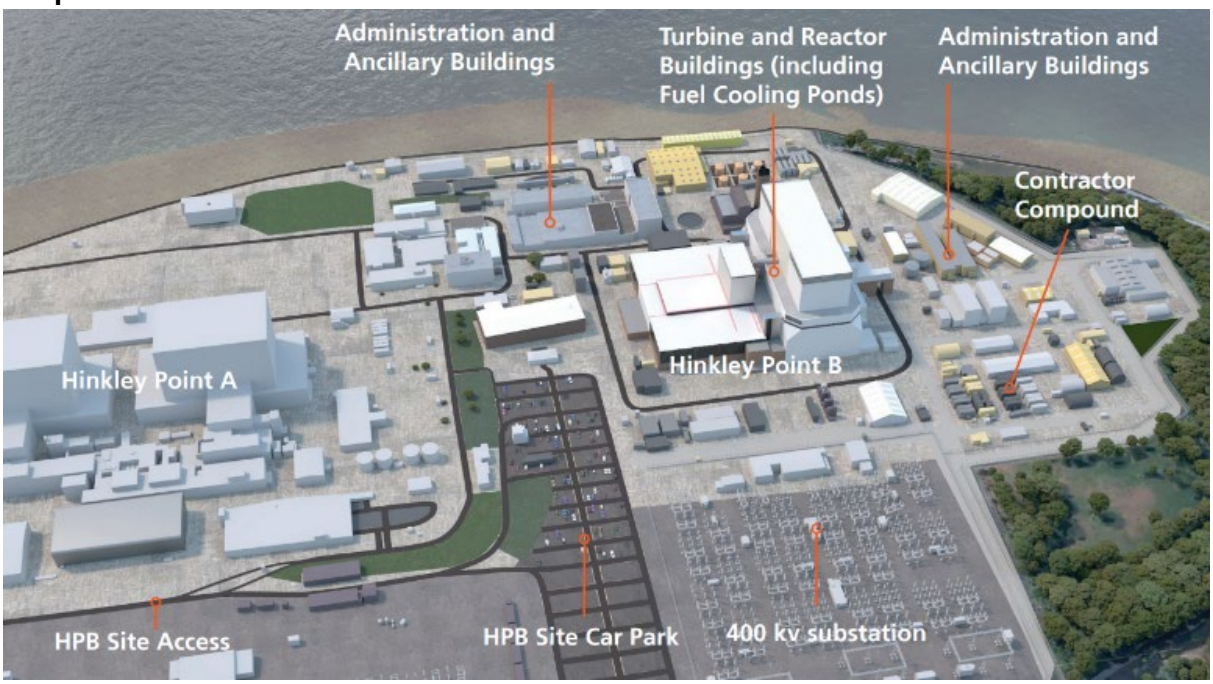
2.2 The works areas and surroundings

2.2.1. Construction of HPB commenced in 1967, with the station becoming operational and generating power in February 1976. The nuclear plant comprises two Advanced Gas-cooled Reactors (AGR) providing steam at high pressure and temperature to two dedicated 660 MW steam turbine generators. Since 1976, HPB has generated 311 TWh low carbon electricity which is the equivalent avoidance of 108 million tonnes of Carbon Dioxide (CO_2) compared to the direct emissions of combined cycle gas turbines of conventional thermal power stations. HPB ceased generation on the 1st August 2022.

Site location

2.2.2. HPB is located on the north coast of Somerset on the shore of the Severn Estuary. The land within the Site lies at an elevation of approximately 10 m Above Ordnance Datum (AOD). It predominantly features built form development including the buildings housing the reactors and adjoining turbine hall towards the centre of the Site, and smaller ancillary buildings, warehouses and tanks around this central feature. Key structures on the Site are shown in Graphic 2-1.

Graphic 2-1 - Location of notable site areas



2.2.3. These buildings all sit within a wider area which outlines the Nuclear Site License Boundary for HPB. At HPB, this Nuclear Site License extends beyond the area used for power generation to the south, south-west and east. The Nuclear Site License area is sub-divided into the 'operational land' that is within the Works Area and the 'non-operational land', within the Site but outside of the Works Area as shown on **Figure 1.1**.

2.2.4. The operational land incorporates areas that sit within the HPB boundary security fence and specific areas outside of the HPB boundary security fence, such as the Sewage Treatment Plant, which services both HPB and Hinkley Point A Nuclear Power Station (HPA), car parking and substation compounds, which ultimately support operations on the Site. The non-operational land covers areas to the south, west and east of the power station outside of security fencing. This area comprises a mosaic of different habitats including broadleaved and mixed plantation woodland, semi-improved neutral grassland, scrub, tall ruderal vegetation and ephemeral/short perennial vegetation.

2.2.5. The Works Area defines the indicative area required for the decommissioning and deconstruction of HPB. It includes buildings, structures (including the Cooling Water System) that have been utilised for the operation of HPB and will be decommissioned following the grant of consent under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)[1] (EIADR). Some of these areas lie outside of the Nuclear Site License boundary. The Works Area covers approximately 22.71 ha (see **Figure 1.1**).

2.2.6. HPB is approximately 12 km north-west of the largest local settlement of Bridgwater (see **Figure 2.1**). Smaller settlements of Wick, Burton, Shurton, Stogursley and Stolford are within 3 km of the Site. The Site is within the jurisdiction of Somerset Council which is a Unitary Authority for Somerset.

2.2.7. HPA which ceased generation in 1999 lies to the west of HPB and is currently undergoing decommissioning managed by Nuclear Restoration Services (NRS). NRS released a case study in 2021 outlining that the previous strategy for decommissioning Magnox reactor sites to defer Final Site Clearance for approximately 85 years from end of generation may not be the most suitable decommissioning methodology for all sites managed by NRS, with the NDA endorsing a site-specific approach to reactor dismantling. This study outlined that for some sites, this will result in their decommissioning being brought forward whilst for others a deferral strategy with varying deferral periods will be the chosen approach. At the time of writing, NRS has not published a revised decommissioning strategy for HPA, and thus for the purposes of assessment, such as in **Chapter 21: Cumulative Effects Assessment,** it is assumed that Final Site Clearance of HPA will commence in approximately 2085 after entering Care and Maintenance (equivalent to the 'Quiescence phase' as defined in **Chapter 1: Introduction**) in approximately 2040. Any change in decommissioning strategy of the HPA site will be subject to confirmation that no likely significant environmental effects arise from the proposed change in approach. If changes are found to have likely significant effects, NRS will progress a formal change under Regulation 13 of the EIADR, which may require the submission of a revised EIA to the ONR for its consideration before it grants consent for the change.

[1] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

2.2.8. Immediately to the west of HPA is the Hinkley Point C (HPC) New Nuclear Build site, with two European Pressurised Water Reactors which is under construction and is expected to commence generation of around the end of the decade. Collectively these sites are referred to as the Hinkley Point Complex.

2.2.9. The Hinkley Point Complex is largely surrounded by land in agricultural use with regular medium sized fields divided by fence-lines and hedges. HPB is bounded to the south and east by a belt of woodland which screens the lower buildings within the Works Area from view. Beyond this, its surroundings are predominantly open, gently rolling, lowland with the land rising from the coast and then down into the Holford valley, before again rising and falling towards Bum Brook and the village of Shurton.

2.2.10. The main features surrounding the Site to the north and east are mudflats. The intertidal mudflats of Bridgwater Bay are separated from the Site by a low cliff, of around 5-10 m in height. At low tide the shore adjacent to the Site comprises a narrow rock platform, interspersed with and fringed by mudflats; while to the east, the mudflats extend up to 500 m from the shoreline at low water. Bridgwater Bay forms part of the Severn Estuary. A round cairn known as Pixie's Mound, a Scheduled Monument, lies approximately 350 m to the south-west of the Works Area.

2.2.11. To the south of the Works Area, within the Site is a 400 kV substation which connects HPB to the national transmission network. The 400 kV substation is on operational land but is on a long-term lease agreement to National Grid Energy Transmission. Beyond this lies a Sewage Treatment Plant, servicing foul water from HPA and the Site.

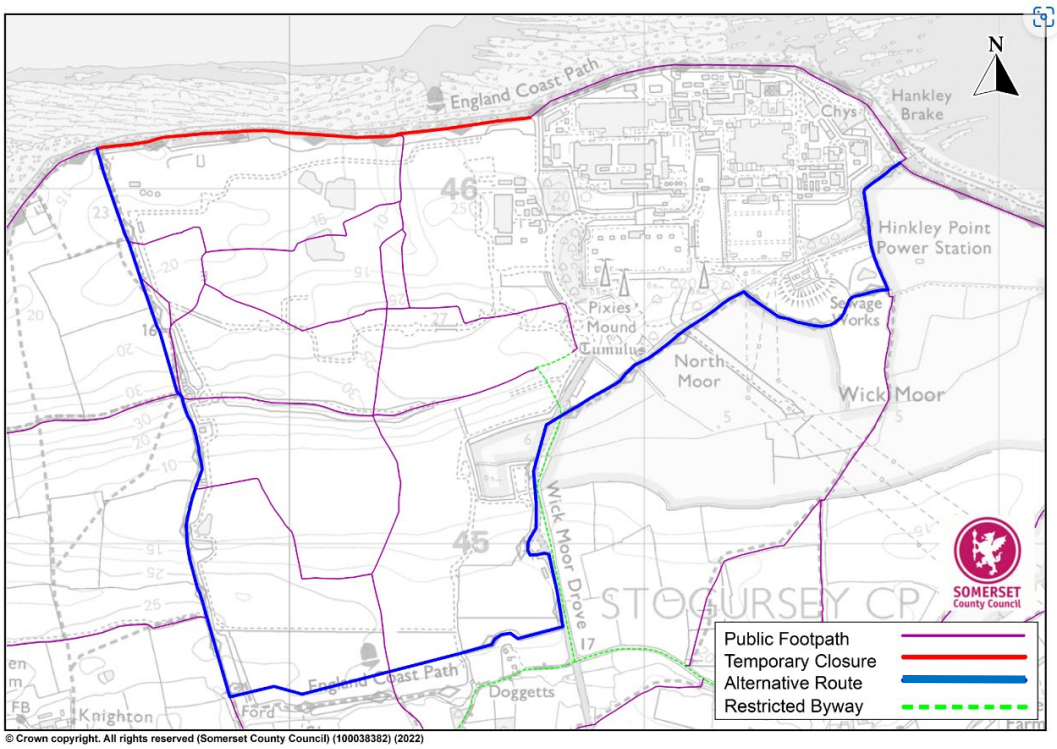
Existing site surroundings

2.2.12. Notable environmental features in proximity to the Site are shown on **Figure 2.2**. The Site is located adjacent to the Severn Estuary which holds multiple international and national environmental designations (see **Figure 2.2),** which the Works Area extends into:

- Bridgwater Bay Site of Special Scientific Interest (SSSI);
- Severn Estuary Special Area of Conservation (SAC);
- Severn Estuary Special Protection Area; and
- Severn Estuary Ramsar.

2.2.13. The King Charles III Coast Path, a nationally designated route follows the coast to the north of the Site. This is currently diverted inland, routed around the south of the Hinkley Point Complex (see **Graphic 2-2**) whilst the construction works for HPC are ongoing but will be reinstated shortly after the start of generation at HPC.

Graphic 2-2 - King Charles III Coastal Path Diversion



2.2.14. To the immediate south of the Works Area is woodland designated as a Local Nature Reserve. This is currently managed by EDF for biodiversity enhancement and whilst it is situated within the Site boundary, it is non-operational land and therefore is not within the Works Area.

2.2.15. There are two primary vehicular routes to the Site. Both routes follow: Wick Moor Drove; unnamed road (known locally and hereafter as C182) between Shurton and the road to Otterhampton; Withycombe Hill; Cannington Bypass and the A39 between Cannington Bypass and Quantock Road/A38 at Bristol Road Traffic Signal Junction. The routes diverge at the A39/Quantock Road roundabout as follows:

- South Route: Quantock Road/Wembdon Road/North Street/Broadway (southwest from the A39/Quantock Road roundabout) to the A38 and the A38 to the M5 Junction 24 roundabout; and
- North Route: A39 (northwest from the A39/Quantock Road roundabout) to the Bristol Road (A38)/A39 Traffic Signal Junction then north on the A38 to the M5 Junction 23, via the A39.

2.2.16. The nearest train station to the Site is located in Bridgwater (18 km by road). There is a railhead in Bridgwater that the Applicant currently uses for the transportation of spent fuel flasks to the nuclear fuels reprocessing plant in Sellafield. Owing to the distance from the Works Area, the location of this railhead is not suitable for frequent use for movement of bulk materials.

Site description

2.2.17. The layout of the Works Area may be considered in three parts for the purposes of decommissioning:

- The Radiation Controlled Area (RCA) – The main RCA consists of the Reactor Building (containing the two reactors) and a number of adjoining structures containing plant and structures

that have the potential to contain radioactive contamination. This area includes areas such as the fuel cooling ponds, the debris vaults and other radioactive waste treatment plant and buildings. There are also other RCAs within the Works Area, such as the gas circulation maintenance workshop and the Combined Radioactive Waste Disposal (CRAWD).

- The Conventional Area - consists of the area outside of the RCA. It includes ancillary plant and buildings such as the Turbine Hall and services building, cooling water systems and numerous other buildings, compounds, roadway, hard standings which make up the operational site. For the purposes of assessment, it also includes areas outside of the main security fence such as the car parks, and other structures that require removal as part of the Proposed Works such as the Sewage Treatment Plant.
- The Marine Works Area – The Cooling Water Intake and Outfall and the associated offshore sections of the tunnels are not included within the Nuclear Site License boundary but are key parts of the power station that will be decommissioned.

2.2.18. A double security fence surrounds the Site and HPA. An additional fence separates the two power station sites.

2.2.19. The two AGRs at HPB are housed within pre-stressed concrete pressure vessels within the Reactor Building in a central location of the Site. This Reactor Building is topped by a rectangular charge hall to allow for the changing and removal of fuel from the reactor. Common fuel handling, active maintenance and active waste disposal facilities are arranged in a central services block between the two reactors. Other common reactor services and fuel dispatch are also accommodated in the central services block. The charge hall is a steel-framed structure enclosed with lightweight steel cladding and roofed with metal decking. The total building size is approximately 120 m long, 50 m wide and 65 m high above ground level.

2.2.20. Ancillary services associated with the handling of active materials and fuel are grouped on the east side of the Reactor Buildings. These are adjacent to the central services block, together with the gas treatment and filtration plants. The cooling ponds, Active Effluent Treatment Plant (AETP) and Pond Water Treatment Plant (PWTP) are situated adjacent to each other below ground level to the east of the Reactor Building. Other buildings within the controlled area include the decontamination centre, fuel store and maintenance cell.

2.2.21. To the west of the Reactor Building is the adjoining Turbine Hall which holds two turbines. Buildings to the east of the Reactor Building include buildings such as the Contractors workshops, Outage Office Buildings and Contaminated Radioactive Waste Disposal (CRAWD) Facility which is a Radiation Controlled Area. Chemical stores for substances such as hydrogen and diesel are located to the north and west of the Turbine Hall, with some plant and boilers also located in this area.

2.2.22. To the south-east of the Reactor Building lies the contractors compound and various contractor storage buildings.

2.2.23. To the north and west of the turbine hall is a group of buildings which includes the main site administration building, further office facilities, the staff canteen, workshops, various stores. North of the turbine hall is also the Gas Circulator Workshop which is also a Radiation Controlled Area.

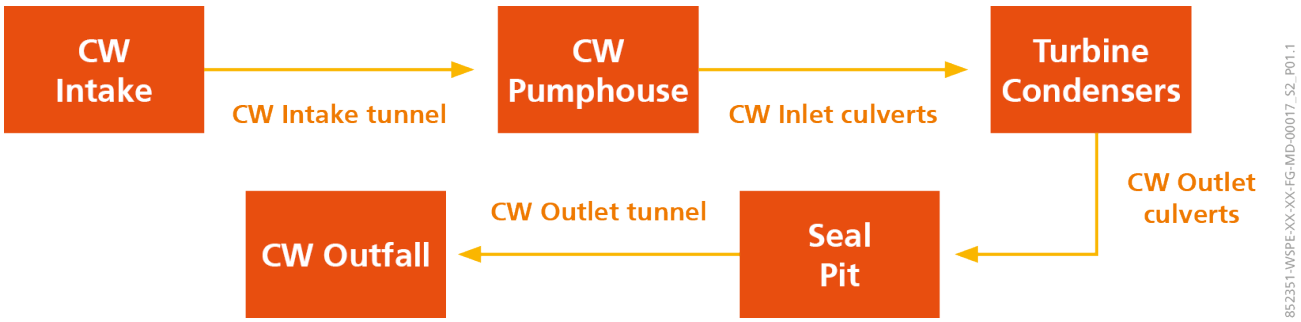
2.2.24. To the north of these buildings are the majority of above ground elements of the CW system including the CW Pumphouse.

Cooling water system

2.2.25. The above ground features of the cooling water (CW) System are shown in Graphic 2-3. A schematic drawing of the CW system is shown on **Graphic 2-4**.

Graphic 2-3 - Above ground features relevant to the CW System

Graphic 2-4 – Process diagram of HPB CW system



2.2.26. Seawater is drawn from the Severn Estuary at the CW Intake approximately 540 m off-shore. The structure was constructed around 1960 as part of HPA. At the time of construction, the intake system comprised 6 number 12' (3.66 m) diameter Intake tunnels built to allow for expansion of electricity generation at Hinkley Point and provide cooling water for additional stations.

2.2.27. The CW Intake structure consists of vertical reinforced concrete driven piles with an in-situ reinforced concrete deck slab. The vertical shaft below the intake structure connects to the 3.66 m diameter concrete lined CW Intake Tunnel which runs for a length of 1,078 m through rock to the forebay of the CW Pumphouse. The Cooling Water Intake Structure is comprised of an outer 16 m diameter by 16 m deep by 1.7 m thick reinforced concrete caisson. Above the -3.35 m level, the structure is comprised of a reinforced concrete framed structure with steel walkways and access stairs. Within the centre of the structure there is a reinforced concrete access shaft running from the base of the Intake Structure at the -19.51 m level to the 15.24 m level. The shaft is 5.49 m in diameter and is constructed from reinforced concrete. The lower sections of the intake are split into 6 separate shafts which feed 6 separate intake pipes, however only one shaft (B2) provides cooling water to HPB. Of the remaining shafts, three are unused and terminate only a few metres from the structure and the other two were utilised by HPA, and have since been decommissioned by in-situ grout filling at the landward end of the tunnel.

2.2.28. Shaft B2 connects to a 3.6 m diameter concrete lined CW Intake Tunnel at the bottom of the Intake Caisson and runs for a length of approximately 650 m in a south easterly direction through rock to the forebay of the CW Pumphouse. A ~560 m long Access Tunnel gives personnel access to the base of the Intake Caisson from a land entrance/building that is located close to the shoreline, in the north-west of the HPB site.

2.2.29. The CW Pumphouse is in three sections; forebay, the screen chambers and the pumphouse itself. The whole structure is located at the north of the Site. The forebay is attached to the north-side of the screen chambers. This is an uncovered reinforced concrete sub structure, with the base at approximately 12.5 m below ground level, which connects to the end of the CW Intake Tunnel.

2.2.30. The screen chambers are attached to the north of the CW Pumphouse and they contain four Drum Screens, each a steel wheel structure, for filtering the seawater drawn through the drum screens by the CW Pumps. The CW Pumps send cooling water to the Turbine Hall via the two 3 m diameter CW Intake Culverts. The culverts run underground from the CW Pumphouse to the turbine condensers in the Turbine Hall. The pumps are protected from the external environment with a steelwork superstructure which extends approximately 8 m above ground.

2.2.31. Water leaving the turbine condensers flows through two 2.5 m diameter concrete lined Outlet Culverts which run north-east from the Turbine Hall basement, for approximately 50 m to the Seal Pit.

2.2.32. The Seal Pit is an 18 m diameter open topped concrete structure (14.3m deep) with a weir in the base which the water flows over and into the CW Outlet Tunnel.

2.2.33. The 3.4 m diameter CW Outlet Tunnel runs north-east from the Seal Pit for approximately 140 m to a point near the sea wall where it joins a 3.5 m square tunnel constructed as part of HPA. This section of the tunnel runs out of the Severn Estuary for a length of approximately 200 m to a discharge point and then into an approximately 220 m Outfall channel on the shore.

2.2.34. Active effluent is piped underground from the AETP on the east-side of the reactor building, to the north of the Site, where it enters the CW system at the entry point to the circular tunnel adjacent to the sea wall. The active effluent is released into the CW Outlet Tunnel in this location where it is diluted by cooling water which then discharges at the CW Outfall. The existing Radioactive Substances Regulation (RSR) permit (EPR/CB3735DT) is not reliant upon operation of the CW Pumps at HPB, but working practices are that discharges are made during CW flow and in proximity of high-tide (completed between 1 – 4 hours after high tide) in the Severn Estuary.

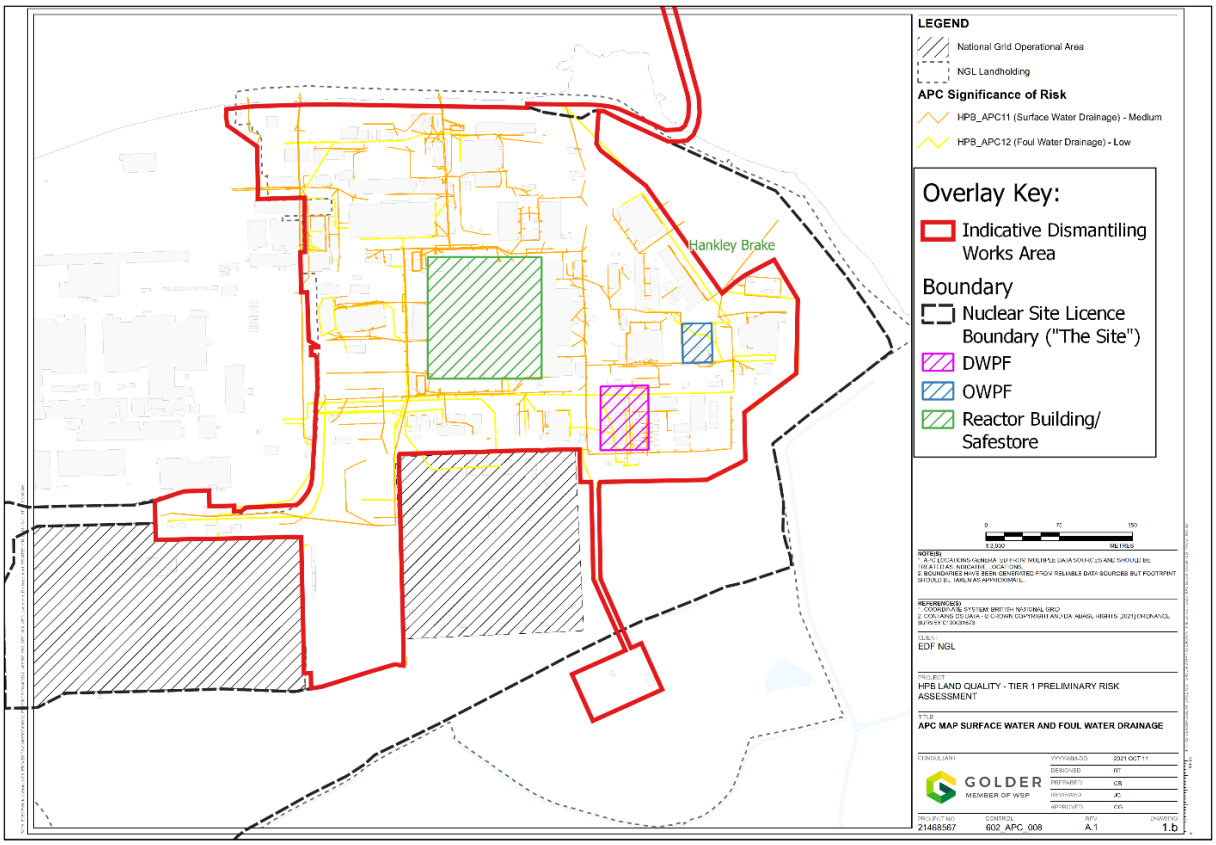
Drainage infrastructure

2.2.35. Within the Site (as per **Graphic 2-5**), the existing surface water drainage system receives storm water from the Site.

2.2.36. Drainage arising from plant sources is conveyed to the drain pit where it is pumped to the surface water drainage system via an oil interceptor.

2.2.37. The surface water drainage system is kept separate from the cooling water arisings which are both then discharged to the tidal waters of the Severn Estuary at separate locations via trade effluent discharge consents 101266/TR1 and 101266/TR2 respectively.

Graphic 2-5 - HPB surface water and foul drainage



2.3 Description of the Decommissioning Process

Overview

2.3.1. This section sets out the description of the decommissioning proposals for the purposes of this Environmental Statement (ES). Whilst timescales and working practices may change while the decommissioning plan becomes further developed, it provides a basis for assessing a 'reasonable worst case' for the Proposed Works, with respect to environmental effects at HPB, based on the current understanding of the proposals. Ongoing development and changes to the decommissioning proposals by the Site Licensee post the issue of the EIADR consent will be assessed against the basis of this project description as outlined in **Appendix 5C** 'HPB Managing EIADR Compliance'.

2.3.2. For the purpose of this ES, the Proposed Works do not include the defueling of the reactor in accordance with the definition of decommissioning and requirements for assessment under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[1] (EIADR) (as amended).

In order to deliver the preferred approach to AGR decommissioning of deferred dismantling with Early Safestore scenario (Option 4b) as set out in **Chapter 3: Alternatives**, the Proposed Works will be undertaken in three phases:

- Preparations for Quiescence phase;
- Quiescence phase; and
- Final Site Clearance phase.

2.3.3. The indicative decommissioning timeline within **Graphic 2-6** has been utilised for the purposes of assessment. It represents the current understanding for the 'reasonable scenario' for the completion of works in the Preparations for Quiescence phase which also is considered to represent the worst-case for the assessment via an intensification of the Proposed Works on site relative to a slower Preparations for Quiescence phase.

Graphic 2-6 - Decommissioning Timeline

Phase	Defueling				Preparations for Quiescence													Quiescence							Final Site Clearance											
Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042-2100	2101	2102	2103	2104	2105	2106	2107	2108	2109	2110	2111	2112	2113	2114	2115	2116	2117	2118
Years post end of generation	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20-78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96
Defueling																																							
Preparations for Quiescence																																							
Operational HAW retrieval																																							
Waste Processing Facilities																																							
DWPF																																							
OWPF																																							
Active Area deplanting																																							
Conventional Area Deplanting and Demoltion																																							
MR Zone 1																																							
MR Zone 2																																							
MR Zone 3																																							
MR Zone 4																																							
MR Zone 5																																							
MR Zone 6																																							
MR Zone 7																																							
MR Zone 8																																							
MR Zone 9																																							
MR Zone 10																																							
MR Zone 11																																							
CW System Decommissioning																																							
Safestore construction																																							
Quiescence																																							
Final Site Clearance																																							
Waste Management Centre																																							
Safestore Dismantling																																							
Reactor building preparatory works																																							
Active Area deplanting and reactor dismantling																																							
Retrieval and Management of Stored Active Waste from HADVs																																							
Reactor Building Conventional Demolition																																							
Site remediation and final landscaping																																							

Timing of whole phase | Construction & commissioning/demolition of facilities | Activity in operation/running | Main activity

*Zone 5 incorporates the 400 kV substation and associated buildings to the south of the Works Area, which is on a long-term lease agreement to National Grid and is therefore not considered to be part of the Proposed Works.

** MR Zone 1 activity in 2025 indiciates site preparation activities

Preparations for Quiescence phase

2.3.4. The Preparations for Quiescence phase begins after defueling and forms the first phase of the Proposed Works.

2.3.5. The purpose of the Preparations for Quiescence phase is to reduce the hazard presented by the radioactive and non-radioactive materials and wastes on site and to place the Site into a passively safe and secure state for the Quiescence phase where the need for human intervention to maintain acceptable conditions is minimised.

2.3.6. The Preparations for Quiescence phase will be a period when the Site undergoes a relatively large amount of civil engineering work, including demolition of all existing buildings, except for the Reactor Building complex which will be repurposed and modified to create a 'Safestore' to allow further radioactive decay to occur during the Quiescence phase. The Preparations for Quiescence phase will involve the processing, packaging and removal of some operational Higher Activity Waste (HAW) that has accumulated on-site and the processing, packaging of Lower Activity Waste (LAW) generated as a result of deplanting and demolition activities.

Deplanting and deconstruction

2.3.7. Some hazardous chemicals and hazardous items within the plant have been drained and removed from the Site already in parallel to defueling as part of hazard reduction works. This has only been undertaken when the following requirements have been met:

- Where the purpose of the work is solely hazard removal for plant where ongoing site activities do not necessitate the chemicals presence on-site;
- Where chemicals could be brought back to site and plant could be re-commissioned should it be necessary (i.e. removal of chemicals do not permanently prevent its use); and
- Where the works can be done safely and in-line with existing site processes to prevent environmental impacts from the works.

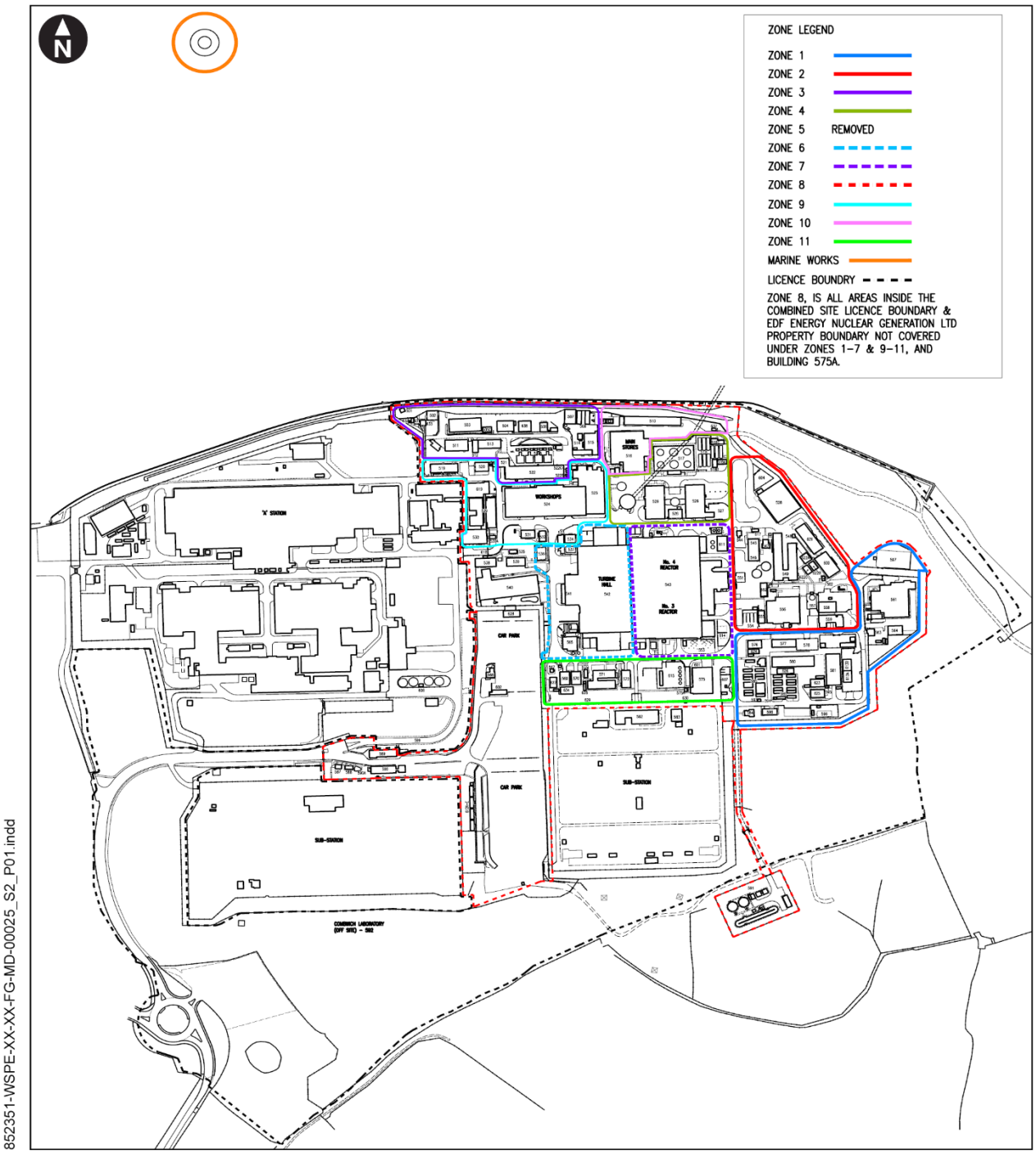
2.3.8. Deconstruction includes the removal of buildings and structures to ground level, and deplanting, as part of the Preparations for Quiescence phase.

2.3.9. Deplanting is the process by which plant is isolated, drained of fluids, flushed/cleaned (if necessary) and removed from the Site. Full deplanting will be undertaken in the Conventional Area in sequence, with building demolition. Deplanting will also be undertaken in the RCA in an activity referred to as 'Active Area Deplanting'. This will support the removal of some buildings within the RCA, but will also remove hazards where appropriate from the Safestore prior to the Quiescence phase to help enable simpler monitoring and maintenance.

Conventional deplanting and deconstruction

2.3.10. The deplanting and deconstruction of buildings and structures in the Conventional Area during the Preparations for Quiescence phase is broken into 11 zones. **Appendix 2A** outlines the buildings and structures included within each of these 11 zones (See **Graphic 2-7**). The location of these zones can be found on **Graphic 2-6**. It is expected that buildings within the RCA which are scheduled for deconstruction in the Preparations for Quiescence phase will be deplanted and fully decontaminated under the Active Area Deplanting works, which will enable them to be demolished as conventional buildings using conventional methods as outlined in the programme in **Graphic 2-5**.

Graphic 2-7 – Location of Buildings within each Managed Retreat Zone



2.3.11. Exact methodologies to be used during deconstruction will be determined by the appointed contractor at the time, although it is expected that larger plant will be cut or split on site into components or sub-components to facilitate its simpler removal from the Works Area.

2.3.12. All Conventional Area buildings and structures will be demolished almost in their entirety, including the removal of any cabling to ground level, leaving slabs in-situ. Whilst demolition is generally to ground level, some buildings on-site that contain basements will remain in-situ following deplanting.

Likewise, there is a need to undertake some works below ground level to remove trenched pipework where land contamination may have occurred during operation.

2.3.13. The works below ground will create additional voids to those already in situ, with their anticipated size and assumptions detailed in **Table 2-1**. It is currently planned that existing drainage infrastructure is left in-situ to assist the drainage of the Site during the Quiescence phase and thus no assumption of the size of these voids are outlined below.

Table 2-1 - Table of main voids created during the Preparation for Quiescence phase

Building	Void (m^3)		Assumption
Turbine Hall	47,457		Void may be left partially filled through the Quiescence phase and managed accordingly.
Forebay	2,100		Infilled with material generated from demolition activities
CW Pumphouse (inc. chambers, drumscreens and trash baskets)	24,250		Infilled with material generated from demolition activities but may be left partially unfilled through Quiescence phase and managed accordingly
Gate Valve	380		Infilled with material generated from demolition activities
Seal Pit	2,500		Infilled with material generated from demolition activities but may be left partially unfilled through quiescence phase and managed accordingly
Intake Access Tunnel Shaft	200		Infilled with material generated from demolition activities

2.3.14. The EIADR assumes that all demolition material suitable for use as in-fill (also referred to as site-won material) will be retained on-site to be used as in-fill for voids, specifically those of the CW system and the Turbine Hall basement. This will be subject to the appropriate regulatory regime. Prior to use as in-fill, it is anticipated that rubble debris from the demolition of buildings will first be crushed. Where practicable, concrete crushers that use compression rather than pneumatic hammers will be selected due to their lower noise profile. The crushing process is assumed for the purposes of assessment to be undertaken ‘on-location’ where the material is generated and will incorporate good practice mitigation to reduce dust and noise emissions. The size of plant required will depend on the rate at which it will be required to crush the material and the size and hardness of the concrete. The likely operation therefore would be to stockpile the debris adjacent to the crusher and operate the equipment for only one or two days a week when required before using the material as in-fill promptly thereafter.

2.3.15. There will however not be sufficient suitable in-fill material generated during the Preparations for Quiescence phase to in-fill all void space. It is therefore assumed that any unfilled / part filled voids will be left in-situ for the duration of the Quiescence phase and will therefore require management during this period.

2.3.16. In addition to the voids outlined in **Table 2-1,** there are further substantial voids in the form of the CW tunnels. It is not anticipated that these voids will be completely filled. Further information about how the CW system will be decommissioned is outlined below.

Marine works and cooling water system decommissioning

2.3.17. A new Active Effluent Discharge Line (AEDL) will be installed for decommissioning to enable the Cooling Water Pumps to be turned off and enable the decommissioning of the CW system. This will be implemented by installing a new pipe (100 – 150 mm in diameter) to carry the effluent from its current discharge point at the entry point to the CW Outfall Tunnel adjacent to the sea wall to the Outfall. This pipe will be laid beyond the existing tunnel entrance and discharge at the end of the existing CW Outfall Channel approximately 220 m beyond the CW Outfall (approximately 400 m from the sea wall). Further detail on the optioneering of revised active effluent discharge arrangements for decommissioning are provided in **Chapter 3: Alternatives**. It is assumed that AEDL construction:

- would utilise low tides where practicable;
- could utilise the use of dive teams (where appropriate) to support the works and inspect the works; and
- will work largely from within the existing concrete channel and tunnel system to reduce the potential for sediment disturbance.

2.3.18. Effluent from the Sewage Treatment Plant (STP) will be discharged via a newly installed pipeline, separate to the new HPB AEDL pipe, which will extend from the CW Outlet to carry effluent to the Severn Estuary via the existing CW Outfall. The new AEDL and Sewage Treatment Plant lines will be installed at the same time.

2.3.19. The implementation of the new AEDL and STP discharge line will necessitate a variation of the existing HPB RSR permit, discharge consent and the need for a Marine License.

2.3.20. Before deplanting and demolition of the CW system can commence, it will be necessary to isolate the CW system from the sea. Works undertaken within the marine environment beyond the sea wall will not be undertaken during the months July-September to ensure there are no effects upon important local ecological receptors. The first stage of the CW System demolition process is to lower the existing gates for the forebay/drum screen apertures. The inlet system from the drum screen bay to the turbines will be dewatered by pumping out the water into the forebay.

2.3.21. A new fabricated gate for the CW Intake Structure will be lowered into position utilising a mobile crane operating from a pontoon. Residual water will then be removed from the intake tunnel using conventional methods e.g. pumping, from the top of the intake structure into the Severn Estuary; regulatory controls will be discussed further with the Environment Agency in advance of this work.

2.3.22. The existing gates, for the Outlet Culverts at the Seal Pit, will be lowered into place utilising a mobile crane. The CW Outlet Culverts between the Turbine Hall and the Seal Pit will be dewatered by pumping out the water into the Seal Pit at the access chamber to the culverts.

2.3.23. The Outfall tunnel is exposed at low tide and therefore, for several hours per day it will be dry – hence there is no need to dewater. The sealing of the outfall tunnel will not be done at the end of the tunnel, but at the sea wall. The tunnel will be exposed at the sea wall at the junction of HPB and HPA tunnels. Shuttering will be installed on the HPB section of the tunnel and will be positioned to produce a plug of 2 m (the tunnel will not be cleaned out as it is not anticipated that there will be any significant slurry waste in the tunnel). Concrete will be delivered to site and the void created by the shutters will be filled via gravity (through hoses) to form the plugs, which will isolate the tunnel. Safety barriers will be installed to separate the public from the work face[2]. When this work is complete, the CW Outlet tunnels will be left in-situ.

2.3.24. A concrete plug will be constructed in the CW Intake Tunnel under the sea wall by accessing the tunnel from the forebay. This plug will prevent water ingress to the landward side of the CW Intake tunnels. The CW Intake tunnels are then assumed to be left in-situ and require no further treatment.

2.3.25. After the CW Intake Tunnel concrete plug has been installed, the Intake Structure in the Severn Estuary can be demolished. This is assumed to be completed utilising long reach excavators working from anchored pontoons which will remove the low level perimeter screen structure. The excavators will utilise appropriate tooling to demolish the structures to sea bed level and to load the debris from the sea bed on to a barge for disposal. The excavators will then remove the piles and central core of the structure, with pulverisers and breakers, to the top of the caisson (the debris will be loaded from the sea bed on to a barge for disposal). The top section of the caisson which protrudes above the sea bed will be broken out by the excavators and the debris allowed to fall into the shaft of the Intake Tunnel. Divers may be used to inspect the work face before and after the works.

2.3.26. The CW Pumphouse will be deplanted and demolished requiring plant dismantling operations carried out in deep chambers. The outline method for demolition and plant dismantling of the CW Pumphouse is as follows:

- Prior to removal of the CW pumphouse superstructure, preparatory work will be carried out within the pump chambers to release pipework, CW pumps and motors. The overhead crane will be used to move the equipment to the loading bay for processing;
- The superstructure will be demolished to expose the pump chambers and provide access to lift out any remaining plant and equipment with mobile cranes;
- The superstructure and building frame will be demolished using a long-reach excavator equipped with shears, and cut to be removed from the Site;
- Hydraulic breakers will be used to demolish the forebay; and
- If available, site won material will be utilised to fill voids.

2.3.27. The CW Seal Pit will be demolished to ground level and the voids will then be backfilled if material from on-site demolition activities is available.

[2] Defined as the immediate working area.

2.3.28. The landward tunnel infrastructure between the CW Pumphouse, Seal Pit and Turbine Hall is intended to be grout-filled.

Active area deplanting

2.3.29. The RCA consists of a number of buildings that contain radioactive materials. Apart from the Reactor Building and adjoining structures, these structures include the gas circulator workshops and the CRAWD facility. All these buildings set away from the Reactor Building will be demolished to ground level during the Preparations for Quiescence phase.

2.3.30. Although the basic deplanting and demolition techniques applied to radioactive facilities will be similar to those used for plant and buildings in the Conventional Area, well-established and effective techniques for controlling and containing radioactive contamination and reducing radiation exposure will be applied in line with the As Low As Reasonably Practicable (ALARP) principle. For example, where necessary, work will be done within temporary enclosures or containment structures, which will be specially ventilated and filtered.

2.3.31. Deplanting within the Reactor Building will be undertaken to make the plant safe prior to the modification of the building into the Safestore for the Quiescence phase and to ease monitoring and maintenance of the facility through this period.

2.3.32. Prior to demolition, radioactive facilities (excluding the Safestore), will be de-planted and de-contaminated down to pre-specified levels. Radiological surveys will also be made at the work face[2] to confirm that the radioactive contamination has been removed to the required level, prior to pre-processing and packaging. Radiological surveys will also be made of demolition rubble arisings. The objective of this monitoring will be to ensure solid wastes classed as LLW are transferred to the proposed Decommissioning Waste Processing Facility (DWPF) (see **Section 2.4** and **Chapter 3: Alternatives**) for further pre-processing and packaging prior to waste consignment. All discharges of airborne radioactive contamination or liquid effluents will be monitored and controlled in accordance with the RSR permit. Following this, buildings will be demolished to ground-level as part of conventional deconstruction as outlined above. Further information on waste management during the Preparation for Quiescence phase is provided in **Section 2.4**.

2.3.33. The Active Area deplanting works in the Preparations for Quiescence phase also require the removal of some operational Intermediate Level Waste (ILW) currently stored on site within specially designed tanks, vaults and stores. These wastes will be processed and removed from site in accordance with Best Available Techniques (BAT). Some ILW may require processing and packaging within the proposed Operational Waste Processing Facility (OWPF) to make them ready for long term storage. More information on waste management as part of the Proposed Works is provided in **Section 2.4**.

Modification of the Reactor Building to create the Safestore

2.3.34. The major plant and structures inside the Reactor Building are substantial, robust items within which the radioactivity is shielded and either naturally immobile or fully contained in high integrity vessels. Prior to the Reactor Building being put into a safe and secure state, some deplanting will be undertaken as outlined in the *Active area deplanting and demolition* section above.

2.3.35. The Reactor Building will be modified during the Preparation for Quiescence phase to defer dismantling and ensure that the building and contents remain safe, secure and weatherproof during Quiescence. Further detail on the optioneering process is provided in **Chapter 3: Alternatives.**

2.3.36. For the purposes of assessment, it is assumed that works to the Reactor Building will be undertaken during the Preparations for Quiescence phase. These works will involve:

- Scaffolding of the Safestore to assist removal of existing cladding and glazing;
- Use of Cranes to assist removal / replacement of structural elements of the building; and
- Re-cladding of the Safestore to provide a secure weatherproof envelope.

2.3.37. For the purposes of assessment, it is assumed that the Safestore will house the Charge Hall that sits above the Reactor Building, meaning the Safestore structure will remain the highest building on-site at 66.5 m until Final Site Clearance. The assessment also assumes the retention of the AETP as an annexe on the eastern facade of the Safestore, in accordance with the current strategy.

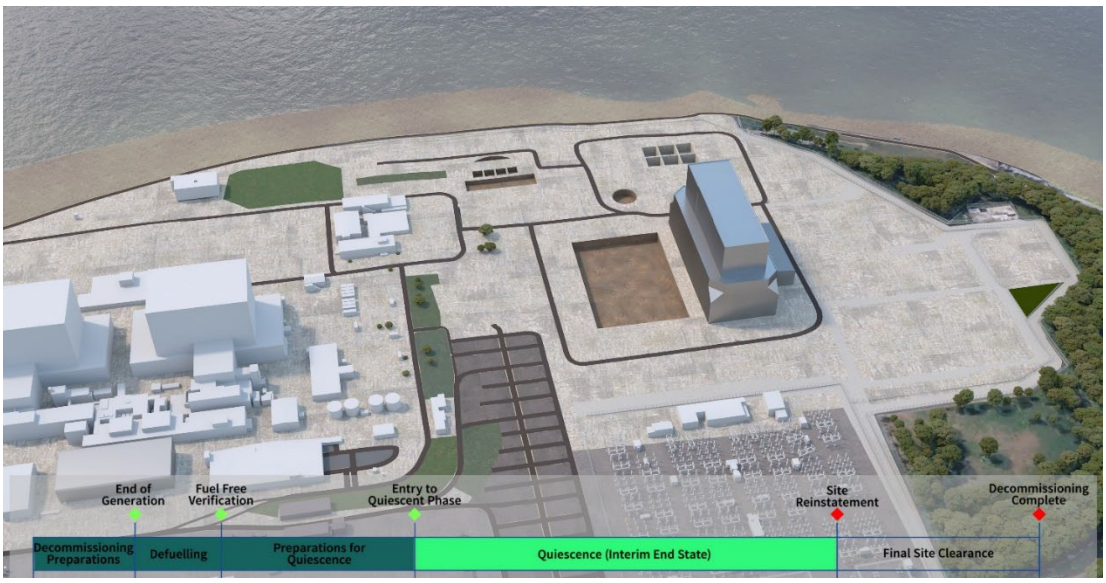
2.3.38. Changes to the reactor building into a Safestore structure would have to be considered under the Town and Country Planning Act regime whereby an application for consent would be submitted to Somerset Council. For the purposes of this EIADR assessment, and in particular, the Landscape and Visual Impact Assessment (see **Chapter 14: LVIA**), which assesses potentially significant effects to local receptors with respect to the setting and views of the Proposed Works, it is assumed that the Reactor Building will be re-clad using standing seam aluminium cladding and would be coloured in 'goosewing grey' or similar colour; similar hues to the existing reactor building.

2.3.39. Any necessary equipment to enable appropriate monitoring and management of conditions within the Reactor Building and to ensure security throughout the Quiescence phase will be installed during the Preparations for Quiescence phase.

The Quiescence phase

2.3.40. Following completion of the Preparations for Quiescence phase, it is estimated the Site will remain in a mainly quiescent state for approximately 70 years. This is to allow for further decay of radioactive plant and materials housed in the Safestore prior to Final Site Clearance to reduce the radioactive hazard when undertaking site clearance activities. The illustrative site layout during the Quiescence phase is shown on **Graphic 2-8.** The only structure remaining throughout this phase will be the Safestore and the annex housing the AETP. It is assumed that none of the Works Area will be released from its Nuclear Site License until after Final Site Clearance, and it is assumed that the existing fence lines on-site will be retained and monitored.

Graphic 2-8 – Site layout during the Quiescence period



2.3.41. Other than routine inspections and minor maintenance as necessary, there is minimal activity anticipated during the Quiescence phase. Should refurbishment of the Safestore cladding be required, there may be a need for a small re-mobilisation to site to undertake the works. This may involve the use of existing concrete slabs as laydown area for materials and portacabins to provide contractor facilities to manage the works. It would also be likely to require the use of scaffolding on the Safestore. Waste from any required recladding of the Reactor Building will be removed from the Site and will be recycled where possible.

2.3.42. Equipment will have been installed during the Preparations for Quiescence phase to enable remote monitoring of the Reactor Buildings and contents to ensure that no unacceptable conditions can occur without knowledge of the site operator. Alarm facilities will be provided so that attention is drawn to any circumstances that may require action. This will enable an appropriate and timely response to be made to any unusual occurrences.

2.3.43. It is unlikely that continuous monitoring by personnel on site will be required for the whole of the Quiescence phase. It is proposed that key parameters within the Safestore will be monitored from a remote location, supplemented by periodic visits by trained and competent personnel.

2.3.44. The inspection regime has yet to be finalised but would include external inspections that will identify damage to building fabric, such as the loss of cladding. Other building and site inspections will include:

- The integrity of site fences;
- Inspection of drains for blockages;
- Inspection of voids left in-situ through quiescence; and
- Inspection of drainage sumps.

2.3.45. These visits would take place both on a planned basis and following severe weather events, with a purpose of seeking to confirm that the Site remained safe and in a good state of repair.

2.3.46. It will be necessary to undertake grounds maintenance on the Site. As with current practice, the area around the security fences will be managed and hard surfaced areas and roadways will be maintained on an 'as required' basis. The clearing of ditches and drains on-site will be undertaken as required. It is intended that vegetation within the site boundary will be maintained to prevent it becoming overgrown.

Final Site Clearance phase

2.3.47. The purpose of this phase is to remove the Safestore from the Site, including all radioactive or other hazardous materials and wastes, for the purpose of de-licensing the Works Area.

2.3.48. This includes the following activities:

- Site re-instatement;
- Reactor Building preparatory works and dismantling;
- Active area deplanting and reactor dismantling;
- Safestore dismantling and demolition; and
- Site remediation and de-licensing of the Site

Site re-instatement

2.3.49. Towards the end of the Quiescence phase, there will be works referred to as site re-instatement to re-establish a site presence and prepare for works during the Final Site Clearance phase. This will include the construction of a Decommissioning Waste Management Centre (DWMC). Whilst the design and location of these buildings will be designed and confirmed closer to the time, an indication of where the DWMC is likely to be located is shown on **Graphic 2-9**. It is anticipated that the DWMC will require consent under the Town and Country Planning Act (or equivalent) prior to their construction. More information about the DWMC is provided in the Waste and Materials Management section below.

2.3.50. Other facilities and work required as part of site re-instatement may include the following:

- upgrading/modification of installed security systems and site access control;
- installation and/or upgrade of power, telecommunications, water, drainage and sewage systems to the Site to support the enlarged workforce and activities to be carried out during Final Site Clearance;
- refurbishment/extension of site roads and car parks;
- construction of offices and welfare facilities;
- construction of workshops, stores, laboratories etc.; and
- construction of change facilities and controlled access points.

Graphic 2-9 – Indicative Final Site Clearance site plan

Reactor Building and contents dismantling

2.3.51. Safestore building preparatory works marks the formal start of Final Site Clearance. These activities include works to ease access into the Safestore, install services and internal modifications to facilitate active area deplanting and reactor dismantling activities.

2.3.52. At all times, all necessary effort and attention will be placed on containing radioactivity, reducing worker radiation exposure, monitoring radioactive materials and appropriately packaging radioactive wastes. The deplanting of radioactive contaminated structures will be completed in accordance with the relevant regulatory guidance and controls.

2.3.53. Following preparatory works, remaining active plant, including the reactor pressure vessels will be deplanted with methodologies in-line with those described for activities during the Preparations for Quiescence phase. Waste from these activities will be processed and packaged via the DWMC. When suitable access is available, works will commence to retrieve operational wastes from the High Activity Debris Vaults (HADVs). These will also be processed in the DWMC.

2.3.54. When all potentially radiological contamination is removed from the Safestore, it will be demolished using conventional methods to ground level and any voids will be filled with suitable material obtained from the demolition activities. Voids anticipated to be filled during Final Site Clearance are outlined in **Table 2-2**.

Table 2-2 - Voids to be filled during Final Site Clearance

Building role	Void (m3)	Void to be filled (m3)	Current plan for voids
Turbine Hall (if void retained through the Quiescence phase)			In-filled with site won material. Any leftover void left in situ at end of Final Site Clearance.
Ponds	1,000	1,000	In-filled with site won material
AETP	1,400	1,400	In-filled with site won material
Debris vaults	4,800	4,800	In-filled with site won material

Site remediation and de-licensing of the Site

2.3.55. For the purposes of this assessment, it is assumed that there will be a future use of the Site and thus it will be left as brownfield land ready for re-development. It is assumed that there is no requirement to remove site infrastructure such as car parks, hardstanding, roads and water mains as this may be of use to a future user of the Site. Contaminated land on the Site will be managed with a Land Quality plan which, in consultation with the Environment Agency, will consign whether ground remediation is required prior to de-licensing of the Site or not.

2.3.56. Given the extensive timeframe, site enhancement measures (e.g. artificial establishment of vegetation) have not yet been considered, however, this will be determined at the appropriate time. It is also recognised that the surrounding environment could change by the time Final Site Clearance commences and appropriate management should therefore be undertaken at that stage.

Deconstruction methods and management

Hours of work

2.3.57. HPB has operated a 24-hours a day, seven days a week operational working pattern through operations and subsequently defueling. During the Preparations for Quiescence phase, working hours will change to represent the different types and nature of ongoing activities on the Site. Whilst some aspects of active area deplanting may necessitate the need for maintaining shift working, the majority of the Proposed Works, such as conventional deplanting and deconstruction and Safestore construction, will be limited to normal working hours between 07:30 and 18:00 hours Monday to Friday. There may be occasional infrequent exceptions to when the working day may be extended in order to complete specific items of work safely. During the Preparations for Quiescence phase, it is anticipated that security personnel will remain on site 24 hours a day, seven days a week, using shift arrangements.

2.3.58. During the Quiescence phase, works on site would be infrequent. However, it is anticipated that any site monitoring or maintenance works would also be focused within normal working hours. During Final Site Clearance, it is likely the majority of works would be focused during normal working hours similar to the Preparations for Quiescence phase, although some shift working may be required.

Site lighting

2.3.59. The existing night-time illumination within the Site consists mainly of internal lights within the transparently clad parts of the Reactor Building and Turbine Hall, together with low level 'street' lights. During the Preparation for Quiescence phase, additional lighting may be necessary at the start and end of the working day during the winter months. Use of such lighting will be at the discretion of the relevant Site Supervisor, to ensure the provision of a safe working environment. Compared to the current night-time illumination at the Site, any visual difference from this temporary additional lighting will be negligible and in-line with lighting that has been occasionally required during station outages during operation. Consideration will be given to the use of directional lighting to minimise any light spill when any further on-site lighting is required for the works. The existing security lighting will be retained through the Preparations for Quiescence phase.

2.3.60. It is anticipated that lighting requirements on site will reduce during the Quiescence phase before increasing during Final Site Clearance in areas around the Safestore, to levels similar to those seen during the Preparations for Quiescence phase. The modification of the reactor building into the Safestore will use opaque cladding, which will limit the visibility of internal lighting.

Plant, equipment and materials

Plant and equipment

2.3.61. **Table 2-3** identifies the anticipated plant, equipment and materials to be used during the Preparations for Quiescence phase. It is assumed for the purposes of the assessment that any equipment required for Final Site Clearance will be similar to the Preparations for Quiescence phase, including bespoke and specialised plant and equipment for reactor dismantling, albeit less plant is expected to be present on site at any given time.

2.3.62. Scaffolding will be used as necessary to facilitate decommissioning activities and only qualified scaffolding operatives will be employed. Components will be managed, stored and maintained on site and re-used as required. Some temporary high access to buildings may be provided by mast climbing platforms. These devices consist of powered elevating platforms that can be moved up and down the face of a building on vertical masts attached to the building. The use of this equipment may be advantageous in certain areas, and it requires less labour in erection and maintenance than conventional scaffolding.

Table 2-3 - Indicative Plant List for the Decommissioning Activities

Demolition Equipment	General Site Equipment
Burning Equipment (Personnel)	Asbestos Removal system and equipment
Crusher (For Conc/Masonry arisings)	Crane Mobile (50 te)
Dump Truck	Crane (150 te)
Dust Suppression	Crane (70 te)
Excavator 30t	Safety/Workboat
Excavator 60t	15M Dive Support Boat

Demolition Equipment	General Site Equipment
Grapple	450HP Tug/Workboat
Impact Hammer 2 T	150mm Dredge Pump & hoses
Impact Hammer 4 T	150mm High Volume Submersible Pump & hoses
Loading Shovel	150mm Univac Pump & hoses
Materials Handler	4-Man Confined Space equipment
Pulveriser	Air Tools + Air Hose
Scissor Lift	Crane Crawler (300te)
Shears 2 T	Concrete Pump 28 m
Shears 4 T	Concrete Pump 31 m
Telehandler	Containerised 2-Diver Surface Demand dive system
20T HGV for Recycling Transportation	Aerial Platform (30M)
5t Mini Breaker	
60T Low Loader	
Compaction Plant	
Crusher (For Concrete/Masonry arisings)	
Hi Reach (21m)	
60t Crane/Excavator Offshore Pontoon	
Compressor 275cfm	
High Pressure Aquablast	
Long Reach (25m)	
Materials Barge	
Materials Handler	
Welding Set 300/400A	
Bulldozer	

2.3.63. Where plant to be delivered to the Site is large, such as cranes, effort will be made to import them to site and construct them on-site where practicable.

2.3.64. The decision as to whether concrete is batched on site or not will be confirmed upon receipt of contractor method statements and will depend on a number of criteria, including: the size of plant; availability of ready mixed concrete in the quantities required to the requisite quality; and price. However, if concrete is batched on site, it is likely to be located in the existing Contractor Compound area.

2.3.65. During the Preparations for Quiescence phase, it is not expected that there will be any requirement to temporarily store large amounts of demolition material prior to either its exportation from site or its use as in-fill material.

Decommissioning workforce

2.3.66. As of December 2023, the HPB workforce comprised 453.40 Full Time Equivalent (FTE) staff and approximately 200 FTE contractors. This is expected to continue to decrease until the end of defueling to a staff headcount of 373 staff.

2.3.67. The workforce for the Proposed Works will fluctuate and is likely to vary through each phase, as described in the following sub-sections.

Preparations for Quiescence phase

2.3.68. After the completion of defueling, it is anticipated that many station staff will be re-trained and redeployed to undertake decommissioning activities. Notwithstanding this, the staff workforce is expected to reduce to between 220-300 employees to deliver the Proposed Works. This element of the workforce is anticipated to remain relatively constant, but will steadily reduce during the Preparations for Quiescence phase.

2.3.69. It is anticipated that the number of contractors working on the Site is likely to be more mobile, fluctuating to meet the demands of activities on site at any given time. It is anticipated that up to 250 contractors may be on-site at any given time during the Preparations for Quiescence phase.

2.3.70. Only suitably trained operatives will be used, and contractors will be encouraged to employ local people where skills exist and are available. There will be a requirement for a mixture of mechanical, civil and electrical tradesmen with project management staff. There will also be a requirement for steel-fixers, scaffolders, bricklayers, plant operators and general deconstruction operatives. It is likely that the bulk of this labour force will be available locally. However, some specialist operatives may need to be brought in from further afield.

Quiescence phase

2.3.71. Although it is assumed that there will be no full-time staff presence on site for the majority of the Quiescence phase, it is expected that there will be a need for some staff on site during the early years. For the purpose of this assessment to ensure a worst case, it is assumed that site-based permanent workforce drops to zero upon entry to the Quiescence phase.

Final Site Clearance phase

2.3.72. Numbers of workers will fluctuate over the Final Site Clearance phase and the exact number cannot be determined at this stage as this phase is too far out into the future, but will likely fluctuate across the period at a level lower than that anticipated for the Preparations for Quiescence phase. A broad

range of skills will be required during this phase and can be expected to include: labourers, demolition contractors, craftsmen, engineers, management and technical specialists.

Asbestos removal

2.3.73. Many buildings across the Works Area contain asbestos. Whilst a proportion of this material has been removed and replaced with alternative materials during operation, asbestos remains within some buildings on site. All accessible asbestos in buildings will be removed during the Preparations for Quiescence phase, with the remainder removed at Final Site Clearance.

2.3.74. Safety during asbestos removal will focus on the hazards associated with manual handling and working at heights, in addition to the hazard of the asbestos itself, and there will be strict compliance with the Control of Asbestos Regulations 2012[3]. In this respect, works to undertake the removal of asbestos will be undertaken using best practice methodologies by licensed asbestos removal contractors.

2.3.75. There are different methods adopted in the removal of asbestos which may vary subject to the type of asbestos present. It should also be noted that removal methods may change over the lifetime of the Proposed Works. Removal of asbestos from the Site is likely to be undertaken using specialist contractors who will utilise full-body suits and respirators to maintain safety and prevent inhalation. Airlocked tents around work areas and water solutions to prevent the spread of dust are likely to be utilised. Water from the asbestos works will be collected and filtered to remove asbestos prior to discharge to the environment.

2.3.76. Asbestos with no radioactivity will be double bagged in its wet state after stripping, hence there will be no liquid waste to be processed from the removal operations itself. Non-radioactive asbestos will be sent to off-site licensed asbestos disposal sites.

2.3.77. It is anticipated that some asbestos may need to be cleared from the RCA. This material will need to be tested for radiation contamination following being stripped and may require disposal off-site as LLW.

Transportation of materials and waste

2.3.78. It is assumed that all materials and wastes will be transported to and from the Site via road. Whilst it is not possible to rule out the need for Abnormal Indivisible Loads (AILs), it is not expected to be commonplace throughout the decommissioning lifecycle. LLW and Operational High Activity Waste (HAW) consigned off-site will be transported off-site utilising processes already embedded during station operation and in-line with the requirements of the Radioactive Materials (Road Transport) Act 1991 (as amended).

Preparations for Quiescence phase

2.3.79. There will be a requirement for some materials to be imported during the Preparations for Quiescence phase, such as for the construction of the DWPF and OWPF, the conversion of the Reactor Building into a Safestore, concrete for the sealing of the CW system, site operational needs, plant and equipment and materials required for processing and packaging wastes. Assuming that 10

[3] UK Government (2012). The Control of Asbestos Regulations 2012. (Online). Available at: https://www.legislation.gov.uk/uksi/2012/632/made (Accessed June 2024)

m^3 or 23 tonnes of material can be transported per lorry, these volumes will result in a total of approximately 13,500 Heavy Goods Vehicle (HGV) loads (27,000 total HGV movements) across the Preparations for Quiescence phase.

2.3.80. Voids will be created on-site from demolition activities in the Preparations for Quiescence phase. These voids will be filled where possible with site won material from demolition activities, but demolition activities in the Preparations for Quiescence phase will not generate enough material to fill all voids. It is anticipated that there will be a material deficit of approximately 67,000 m^3 at the end of the Preparations for Quiescence phase. Work is ongoing on the Void Management Strategy to confirm the viability of leaving voids created in the Preparations for Quiescence phase in-situ through the Quiescence phase.

2.3.81. I t is intended that no aggregate fill material is imported to site solely for the purpose of filling voids in either the Preparations for Quiescence or Final Site Clearance phases. Leaving voids in situ throughout the Quiescence phase therefore forms the basis of assessment for multiple chapters of this Environmental Statement (ES). However, as feasibility studies required to confirm suitable site management arrangements with voids left in-situ at HPB through Quiescence are yet to be undertaken, the importation of infill material to fill voids will form the basis of traffic related assessments (**Chapter 6: Air Quality, Chapter 7: Climate Change, Chapter 15: Noise and Vibration,** and **Chapter 16: Traffic and Transport**). Under this scenario, the filling of the largest void, the Turbine Hall, is assumed to take place in years 9 and 10 of the Preparations for Quiescence phase and will generate a total of approximately 7,600 additional HGV movements (3,800 HGV movements each way).

2.3.82. A profile of transport movements was produced from combining the programme for waste generation on-site from deplanting and demolition activities, requirements for deliveries to site of materials and plant for the Proposed Works and the potential requirement for importing of infill material for voids. This identifies the peak year for HGV movements during the Preparations for Quiescence phase corresponds to Year 9/10 which is approximately 2034. During the peak year, the Site is expected to average up to 30 HGV movements per day (two-way movements) on average across a working week (Monday - Friday).

Quiescence phase

2.3.83. During the Quiescence phase there will be negligible traffic associated with the Site. The only regular traffic movements will relate to security or inspections personnel, with visits for maintenance purposes as and when required.

Final Site Clearance

2.3.84. During Final Site Clearance there will be a requirement for deliveries of various materials, including those required for the construction of the DWMC, deliveries of temporary accommodation for workers (offices etc.), of grout and packages for ILW and LLW packaging, and the plant and equipment used for the reinstatement of the Site and the dismantling activities.

2.3.85. For the purposes of assessment, it is assumed that all waste generated during Final Site Clearance will also be transported by road. It is anticipated that the number of HGV vehicle movements required during the peak year during this phase to implement the Final Site Clearance activities will be less than the number required during the Preparations for Quiescence. The amount of material to be removed off-site will be dependant upon the further development of the Void Management Strategy. If voids are left through the Quiescence phase in-line with the current assumption, it is

assumed that these and any reactor building Final Site Clearance voids can be filled using site won infill material generated during the Final Site Clearance phase.

2.4 Waste and Materials Management

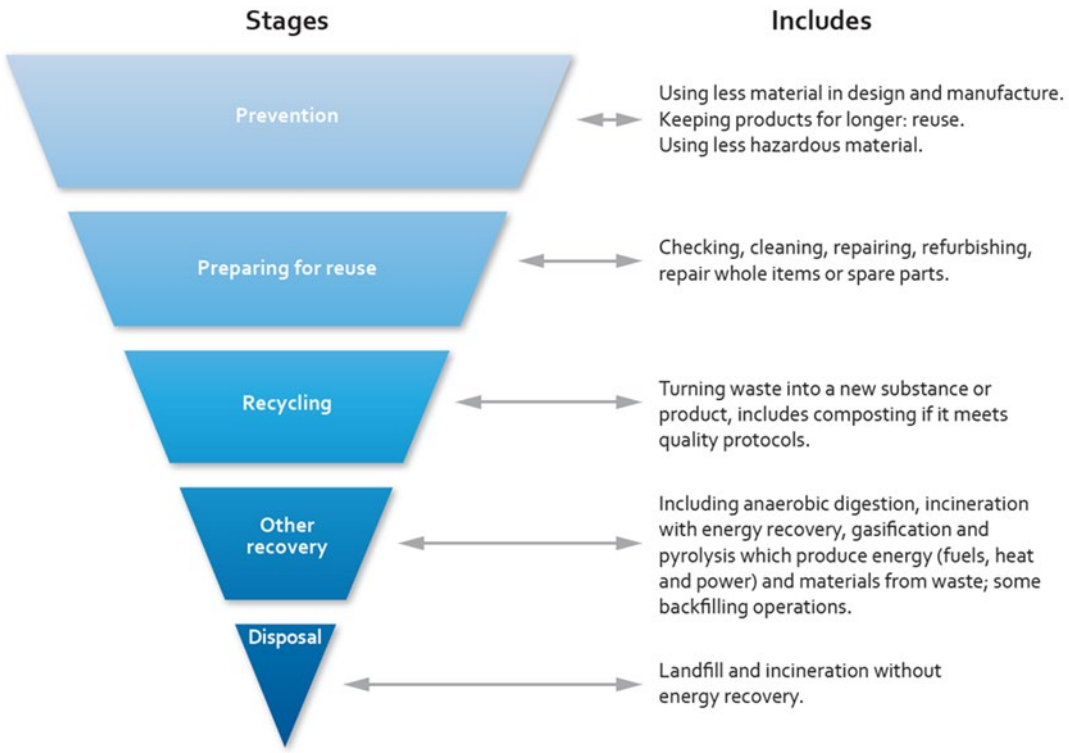
2.4.1. Waste management is a key component of the Proposed Works, with deplanting and demolitions leading to both radioactive and conventional waste streams that will require disposal.

Conventional waste

2.4.2. Anticipated conventional wastes arising from the Proposed Works may include metals, glass, plastics and other miscellaneous wastes similar to any other demolition of industrial type buildings. Due to the age of the buildings and plant at the Site, the demolitions will generate some hazardous wastes such as asbestos and lagging that will require special management during removal to protect members of the public, workers and the environment.

2.4.3. The use of the Waste Hierarchy (see **Graphic 2-10**) is a central component of the decommissioning proposals and has informed key strategic decisions regarding the decommissioning strategy for HPB, all wastes will be handled in line with relevant waste legislation.

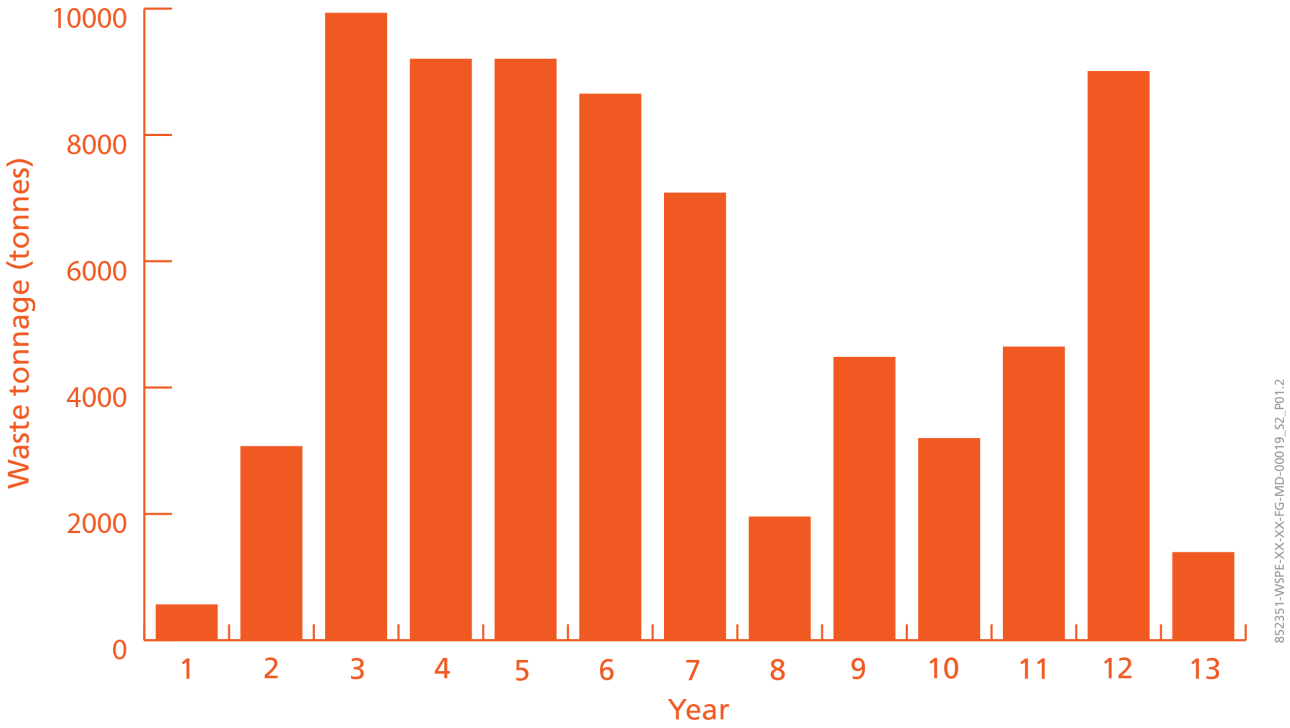
Graphic 2-10 – Waste hierarchy



Preparations for Quiescence phase

2.4.4. During the Preparations for Quiescence phase, the production of waste on-site will vary dependent upon the programme of works ongoing in each year. A profile of waste produced is provided below in **Graphic 2-11.**

Graphic 2-11 – Conventional Waste Profile in Preparations for Quiescence phase



2.4.5. Where practicable, wastes will be segregated and processed in-line with the waste hierarchy to maximise re-use and recycling. Total waste quantities anticipated across the Preparations for Quiescence phase are outlined in **Table 2-4.**

Table 2-4 - Table of waste (conventional) quantities during Preparations for Quiescence phase

Waste Type	Total (T)
Lagging (hazardous)	21
Miscellaneous Hazardous Materials (including Asbestos)	257
Aluminium	262
Cast iron	478
Carbon steel	2,603
Glass	118
Mixed cable	1,337
Miscellaneous materials	19,402
Mild steel	39,828

Waste Type	Total (T)
Non ferrous	1,076
Plastic	5
Stainless steel	1,214
Titanium	212
Total rubble above ground	21,558
Clean rubble above ground	16,168
Hazardous rubble	5,389

Quiescence phase

2.4.6. The Quiescence phase is not expected to produce large amounts of waste. Some waste may be generated as a result of maintenance and inspection works to the Safestore, but this is not expected to be substantial.

Final Site Clearance phase

2.4.7. Conventional waste will also be generated from activities in the Final Site Clearance phase despite the focus of works being works within and around the Safestore as not all material contained will be considered contaminated. Materials produced from removal of the Safestore will, subject to testing, be removed from site as conventional waste for recycling or disposal where practicable. The long period of quiescence will have provided opportunity for partially contaminated materials to experience radioactive decay and thus also increase the amount of waste able to be consigned off-site as conventional waste.

2.4.8. The DWMC will also be removed at the end of the Final Site Clearance phase, and is therefore anticipated to be a source of waste.

Non-radioactive discharges and emissions throughout the decommissioning period

2.4.9. The potential non-radioactive emissions to the environment during the Preparations for Quiescence and Final Site Clearance phases are those that are typical of any construction or demolition operation of similar scale. These would include dust, air pollutant emissions, noise and vibration from the following:

- use of heavy vehicles and other plant;
- traffic movements to and from site including for plant, materials, wastes and servicing/supply of staff;
- operation of concrete crushing equipment and/or other plant for size reduction of rubble;
- movement of soils and rubble;
- construction activities and any associated demolition plant;
- demolition activities and any associated construction/demolition personnel;

- generators and compressors used by construction/demolition personnel; and
- concrete batching (if carried out on site).

2.4.10. None of the activities associated with operation of the DWPF and OWPF involve plant or machinery that would generate noise that would be extensively audible outside the buildings.

Radioactive waste

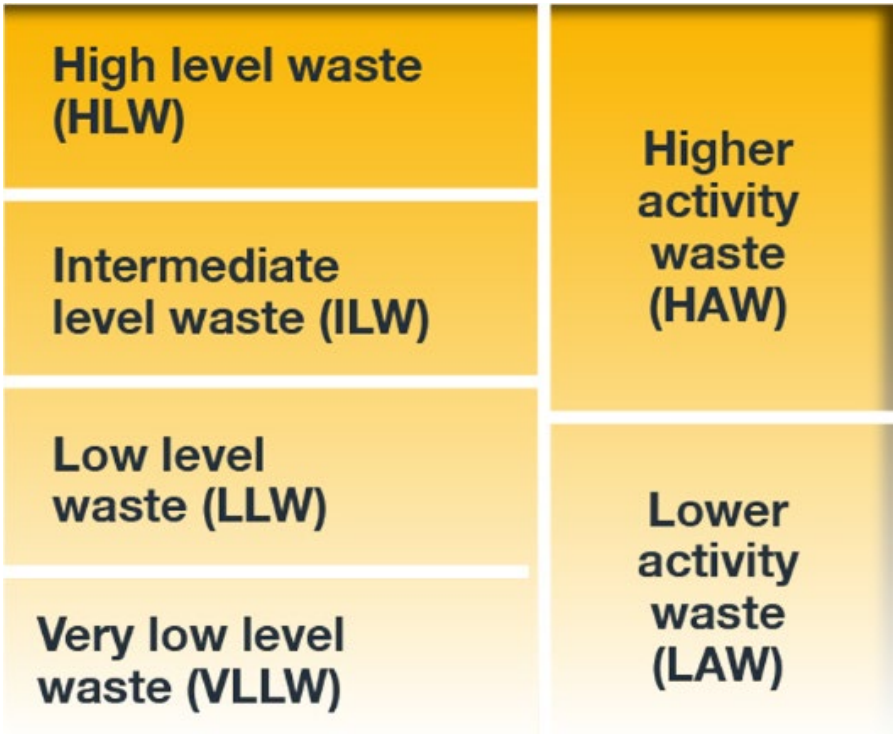
2.4.11. The Proposed Works will require management of both Higher Activity Waste (HAW) and Lower Activity Waste (LAW) as shown in in **Graphic 2-12.** These waste streams are also frequently defined as Low Level Waste (LLW)[4], Intermediate Level Waste (ILW)[5] and High Level Waste (HLW) which overlap the HAW and LAW categories. HLW, is not present at the HPB Site, therefore there is no need for managing HLW during the Proposed Works[6].

[4] LLW is defined as waste containing radioactive materials not exceeding 4 gigabecquerels per tonne (GBq/te) of alpha radioactivity or 12 GBq/te of beta/gamma radioactivity. The term is usually taken to refer to solid wastes that are not exempt under the RSA93 but which are suitable for disposal or treatment at various off-site locations across the United Kingdom.

[5] ILW is defined as waste in which radioactivity levels exceed the upper boundaries for LLW, but which does not require its heat-generating properties to be taken into account in the design of storage or disposal facilities.

[6] In addition to the terms LLW and ILW, there are also some solid wastes that are potentially radioactive but which can be shown to contain radioactivity at levels below the relevant exemption level specified under the Radioactive substances regulations 1993, such that they become out of scope of the regulations and therefore are suitable for disposal as non-radioactive waste. In respect of their radioactive content these wastes are often described as being 'below regulatory concern'. Such wastes can be and are (as soon as possible after they arise) re-used, recycled or disposed of by whatever routes are appropriate, taking account of their non-radioactive characteristics and the Waste Hierarchy.

Graphic 2-12 - Radioactive waste classification types[7]



2.4.12. Radioactive waste management comes under the RSA93[10] and must demonstrate Best Available Techniques (BAT) have been followed for onward management of radioactive waste. Radioactive wastes may be sent off-site for further treatment or compacted to minimise the volume of waste that requires disposal or long-term storage where this can be demonstrated to be the BAT for that waste.

2.4.13. Nuclear power stations such as HPB also generate gaseous and aqueous radioactive wastes that are discharged to the environment under authorisation from the Environment Agency. During operation, aqueous wastes that are permitted to be discharged at HPB discharge into the CW Outlet Tunnel adjacent to the Sea Wall and are subsequently discharged at the CW Outfall utilising the through flow of cooling water.

2.4.14. The remainder of this section identifies the proposed management of radioactive waste arisings, which are anticipated to include:

- vLLW
- LLW;
- ILW; and
- Gaseous and liquid effluents requiring discharge to the environment.

[7] UK Government (2019). Radioactive Waste Strategy. (Online). Available at: https://www.gov.uk/government/consultations/nda-radioactive-waste-management-strategy/outcome/radioactive-waste-strategy-september-2019

2.4.15. The waste treatment, disposal and volumes presented in this subsection have been taken from the UK Radioactive Waste Inventory 2022[8]. Each waste will continue to be analysed and characterised and the BAT waste treatment route will be determined for each waste stream with acknowledgement of the waste hierarchy. This may result in further development in how radioactive wastes are packaged and processed and may lead to some wastes identified as ILW in the UK RWI being consigned for treatment and disposal as LLW. This is also likely to change the number and type of anticipated waste packages arising from each radioactive waste stream outlined in UKRWI 2022.

2.4.16. The Management of Radioactive Waste from Decommissioning of Nuclear Sites: Guidance on Requirements for Release from Radioactive Substances Regulation,[9] produced by SEPA, the Environment Agency and Natural Resources Wales sets out the standards that must be met to release the Site from its nuclear site license and the associated conditions of its RSR permit. This guidance does outline that the on-site disposal of LAW is a potential mechanism for the disposal of some LAW generated from the decommissioning process. On-site disposal of LAW does not form part of the current decommissioning proposals and is therefore not within scope of this EIADR assessment of the Proposed Works. On-site disposal of LAW would only be considered should BAT assessments conclude it is safe to do so and is the preferred method of managing LAW disposal from the Proposed Works. Should on-site disposal of LAW become part of the works to decommission HPB, such disposal would require prior agreement with the Environment Agency following the BAT process to satisfy the requirements of the RSR permit. At this stage, the operator of the Site may be required to submit a change to the EIADR under Regulation 13 which may be accompanied by a relevant assessment. In addition to the regulatory expectations and requirements discussed above, an Integrated Waste Strategy (IWS) will be prepared which will help set out how waste will be managed in accordance with regulatory expectations. A Radioactive Waste Management Case (RWMC) will be used to demonstrate the longer-term safety and environmental performance of the planned management of specific waste(s) and provide a transparent demonstration of optimised radioactive waste management, compliance with regulatory requirements, policy, national and international standards and how waste management operations are integrated across the lifetime plans for the waste and/or the Site as a whole.

[8] UK Radioactive Waste Inventory (2022). 2022 Waste Stream Data Sheets. (Online). Available at: Document Library | UK Radioactive Waste Inventory (UKRWI) (nda.gov.uk) (accessed June 2024).

[9] Environment Agency (2018). Decommissioning of nuclear sites and release from regulation. Available at: Decommissioning of nuclear sites and release from regulation – GOV.UK (www.gov.uk). (Access June 2024)

Preparations for Quiescence phase

LAW

2.4.17. It is assumed that to enable the processing of LAW generated from HPB decommissioning activities in the Preparations for Quiescence phase, a facility called the DWPF is required. Optioneering with respect to the DWPF is ongoing, however the provision of the relevant facilities will be achieved via the refurbishment of existing buildings or the construction of a new build facility on the Site. For the purposes of this assessment, the DWPF is assumed to be a new build facility, in the indicative location shown in **Figure 2.3**. This DWPF would contain the following operational areas:

- reception facilities;
- area for managing potentially contaminated material to allow for monitoring then sentencing to relevant LLW processing area;
- processing areas for unwrapping, identifying, sorting and size reduction activities;
- arising liquid waste handling facilities (drainage, discharge routes);
- decontamination facilities;
- monitoring facilities;
- drum content sorting, assay and interim storage areas;
- drum load out area;
- half height ISO load out route;
- change and toilet facilities; and
- office facilities.

2.4.18. The proposed DWPF will process waste where necessary to improve packaging efficiency prior to disposal off-site at permitted facilities. To reduce void space within containers, the DWPF will house a compaction unit. Packages may be held on site for a number of weeks prior to removal from site within containers to increase efficiencies of the transportation of LLW packages. Packages consigned off-site may be stored for a matter of weeks in an interim store to facilitate efficient vehicle movements of waste onwards to relevant permitted radioactive waste facilities. Whilst in interim storage, the packages will be monitored for external radioactive contamination.

2.4.19. On the basis of radiological characterisation studies carried out to date, together with decommissioning experience at other sites, it is not expected that waste consigned to the DWPF will be re-categorised as ILW and that no ILW will arise as a result of the processing of LLW described above.

2.4.20. Prior to the commencement of development, the DWPF will require planning permission from Somerset Council under the Town and Country Planning Act 1990. The provision of the DWPF is anticipated to commence during the early stages of the Preparation for Quiescence phase. It will be deplanted and deconstructed to ground level as part of the group of buildings within Zone 11 at the end of the Preparations for Quiescence phase.

HAW

2.4.21. The processing of HAW during the Preparations for Quiescence phase is assumed to be undertaken within the OWPF. Optioneering with respect to the construction of OWPF is ongoing however the provision of the relevant facilities will be achieved via the refurbishment of existing buildings or the construction of a new build facility. For the purposes of this assessment, the OWPF is assumed to be a new build facility, in the indicative location shown in **Figure 2.3**.

2.4.22. Studies are also ongoing to identify the BAT for management of operational HAW during the Preparations for Quiescence phase. Processing of operational HAW may involve consigning off-site for further treatment (i.e. incineration, washing, decontamination). On-site processing may involve the encapsulation of ILW in cement and packaging in containers appropriate for long-term storage.

2.4.23. There is currently no central disposal facility available for ILW in England. The Integrated Waste Management - Radioactive Waste Strategy 2019 therefore recommends storage of ILW until a suitable site has been identified and constructed by government for a Geological Disposal Facility (GDF). Following an optioneering study (see **Chapter 3: Alternatives**) considering a new build ILW Store and use of NRS' existing ILW Store at HPA, it was concluded that ILW requiring long-term storage processed and packaged during the Proposed Works would be stored in the HPA ILW (see **Figure 2.4**) Store until a Geological Disposal Facility is available. This strategic assumption is subject to further waste characterisation and studies of the most suitable waste packaging solution for each waste stream.

Final Site Clearance phase

2.4.24. During Final Site Clearance, it is anticipated that one waste processing facility will handle both HAW and LAW arising from decommissioning activities. The DWMC will receive radioactive wastes retrieved from the deplanting and HADV waste retrieval works within the Safestore, sort the wastes as required, carry out any further size reduction or processing of wastes and load the wastes into packages for onward treatment or final disposal. There is not expected to be any requirement for interim storage of HAW during this phase.

2.4.25. The DWMC will contain areas for:

- The receipt and survey of wastes;
- segregation of ILW, LLW and VLLW;
- waste weighing;
- waste package storage;
- package loading and encapsulation;
- final monitoring including for external contamination of boxes; and
- loading of boxes onto road transport.

2.4.26. In order to maximise the operational efficiency of the facility, buffer store areas may be required for both incoming wastes and completed waste packages. The facility will also contain the necessary ventilation and extraction systems, lifting equipment, liquid effluent treatment, building services and personnel change areas required to support its operation. The design will take account of the requirement to decontaminate and demolish the facility at the end of Final Site Clearance.

Low Level Waste

2.4.27. LLW arises during routine operations and maintenance of the power station. During operation, this waste is treated on-site to enable the re-use and recycling of wastes where practicable. Wastes that remain LLW are packaged on-site to be transported to further treatment and disposal facilities or are discharged to the environment under authorisations from the Environment Agency.

Preparations for Quiescence phase

2.4.28. LLW management facilities already exist on Site to process and package LLW before its transfer for onward disposal at suitably permitted facilities. During the Preparations for Quiescence phase the amount of LLW requiring disposal will increase compared to that generated during operation. It is anticipated that this waste will arise from deplanting within the RCA. Items of LLW likely to arise include pipes, shield plugs, filters, plastic, plastic sheeting, grout and scaffold materials. In addition, there will be quantities of concrete and mild steel arising from dismantling operations classified as LLW.

2.4.29. As far as practicable, wastes will be segregated to reduce the amount of LLW requiring treatment or disposal. This will also provide an opportunity to increase the amount of material that can then be re-used or recycled.

2.4.30. All decontamination processes will be similar to those used at other decommissioning sites. Examples of these decontamination processes are wipe down, water jetting, shot blasting, scabbling and chemical decontamination.

2.4.31. Minimisation of radioactive waste disposal and maximisation of re-use and re-cycling will require a ‘controlled clearance’ process to monitor any exempt or potentially exempt radioactive wastes (or other materials) prior to their being removed from the Site. Use of this ‘controlled clearance’ process, which will be an extension of the current LLW management system, will ensure that nothing is taken off the Site unless it is lawful and safe so to do.

2.4.32. Current estimates of LLW arisings during the Preparations for Quiescence phase are presented in **Table 2-5.**

Table 2-5 - Current estimates of volumes of LLW for processing during the Preparations for Quiescence phase taken from RWI 2022

Origin	Estimated Volume as Arising (m3)	Waste Source
PfQ phase: General Reactor LLW	1717	General solid LLW arisings from decommissioning within the Reactor Building prior to Safestore construction.
DWPF: Secondary wastes	504	Wastes arising from contamination and control during waste retrieval and operation of the DWPF.
OWPF: Secondary wastes	504	Wastes arising from contamination and control procedures during waste retrieval and operation of the OWPF.
PfQ Wet Fuel Route	612	General solid decommissioning LLW arisings from the Wet Fuel Route.
PfQ Gas Circulator	1063	Wastes arising from contamination control procedures during plant dismantling of gas circulators.

Note to **Table 2.5**: The percentage of a waste streams to go to LLW Repository are based on assumption of required processing and packaging at time of completion of RWI (2022). Wastes are subject to further characterisation work that may alter the amount of waste that requires long-term storage for disposal and may reduce the number or change the type of packages utilised for LLW.

Quiescence phase

2.4.33. During this phase, it is not anticipated that there would be any sizeable volume of LLW produced on site that would be consigned to off-site facilities.

Final Site Clearance phase

2.4.34. During Final Site Clearance, LLW management and waste processing will be undertaken utilising processed equivalent to those for the Preparations for Quiescence phase. These works will be undertaken within the DWMC.

2.4.35. Solid LLW will arise at this time from contaminated concrete surfaces, filters, protective clothing, polyethylene used to create radioactive containment, tools, equipment, some machinery and, potentially, contaminated ground. Solid LLW will be conditioned and packaged using facilities within the DWMC and consigned to suitable permitted facilities. Current estimates of Final Site Clearance LLW arisings are given in **Table 2-6**.

Table 2-6 - Current estimates of LLW volumes for processing during Final Site Clearance

Origin	Volume as Arising (m3)	Typical Physical Composition of the Waste
Stainless Steel (Reactor) LLW	1270	Stainless Steel
Mild Steel (Reactor) LLW	2406	Mild Steel
Graphite LLW	467	Graphite
Concrete (Reactor and Non-Reactor) LLW	1020	Concrete and reinforced concrete.
Miscellaneous Metals and Materials (Reactor and Non-Reactor) LLW	1149	Variety of mixed decommissioning materials, including metals, organics and other mixed materials.
Secondary Wastes LLW	1611	Will include Metallic, cloth and plastic items. Other organics include incinerator ash. Percentages of constituents are very uncertain.

Note to **Table 2.6**: The percentage of a waste streams to go to LLW Repository are based on assumptions regarding required processing and packaging at the time of completion of RWI (2022). Wastes are subject to further characterisation work that may alter the amount of waste that requires long-term storage for disposal and may reduce the number or change the type of packages utilised for LLW.

Intermediate Level Waste

2.4.36. ILW has been produced during routine operations at the Site. Ion exchange resin and sludges arise from the AETP and PWTP as part of normal operations with engineered tanks providing interim on-site storage. Desiccants have been used during operation of the AGR to dry the gas in the Gas Bypass Plant. This desiccant has been replaced routinely through operations, with expended

desiccant stored on-site within a purpose-built vault near the Gas Bypass Plant. Miscellaneous Contaminated Items (MCI) comprise contaminated waste items arising, for example, metal, concrete or other structural components that have arisen during operations.

2.4.37. Miscellaneous activated components (MACs) comprises items that were used in the reactors and which as a result have become radioactive ('activated'). These are currently stored in purpose-built voids either above or below ground level of the Reactor Building and will be retained within the Safestore footprint.

2.4.38. In addition to operational wastes which require removal during decommissioning, ILW will also be produced as a result of the Proposed Works. These arisings are expected to only be generated from reactor dismantling works during Final Site Clearance. Therefore, it is expected that the Preparations for Quiescence phase will only process ILW generated during Operation, and not new ILW generated from deplanting activities.

Preparations for Quiescence phase

2.4.39. The Preparations for Quiescence phase involves the processing and packaging of ILW present on Site which is located outside of the debris vaults.

2.4.40. Studies are ongoing to identify the Best Available Technique (BAT) for treatment and disposal of operational ILW during the Preparations for Quiescence phase. Processing of operational ILW may involve consigning some ILW off-site for further treatment (i.e. incineration, washing, decontamination), or encapsulation of waste in cement and packaging in HAW containers appropriate for long-term storage.

2.4.41. Sludges and resins are anticipated to be processed within the OWPF. The OWPF will involve either the refurbishment of existing buildings at HPB or a new build facility, to provide plant to process and package this waste ready for further cement encapsulation at HPA and long-term storage within the HPA ILW Store.

2.4.42. Based on the information that informed the RWI 2022 submission, **Table 2-7** outlines the expected volumes of waste to that will be processed during the Preparations for Quiescence phase. Whilst this outlines the expected total volume of each waste type, it utilises a worst case approach to inform estimates of package type and number of packages that would require long-term storage. Further work to understand treatment and processing of these wastes are ongoing as will further characterisation. This is likely to lead to reduced volumes of waste actually requiring long-term storage as some wastes are likely eligible for further treatment such as washing and/or incineration. Waste package type is also liable to change in the intervening period between now and the packaging of waste at the end of the processing phase.

Table 2-7 - Current estimates of ILW Volumes which will be processed and packaged for storage during the Preparations for Quiescence phase.

Origin	Volume as Arising (m3)	Typical Physical Composition of the Waste
Ion Exchange Resin and Sand	10	Ion exchange resins (~45%), Filter backwash sand (~55%).

Origin	Volume as Arising (m3)	Typical Physical Composition of the Waste
Sludge	25	Sand, sludge and water
Desiccants and Catalysts *(This arises as ILW during operation and is securely stored to allow radioactive decay to allow processing and disposal as LLW)*	232	Desiccant (~94%), Catalyst (~2%), Shielding speheres (steel and ceramic) (~3%) and charcoal (~1%)
Wet (Pond) Carbonaceous Debris	2	Dust-like debris washed into ponds and graphite fragments
Miscellaneous Contaminated Items	4	Primarily metallic items such as heat exchangers and candle filters

Note to **Table 2-7**: Package estimates are based on assumption of required processing and packaging at time of completion of RWI (2022). Wastes are subject to further characterisation work that may reduce the number or change the type of packages utilised for ILW.

2.4.43. MAC produced during the operation and defueling of HPB which are stored in the debris vaults will be kept on-site within the Safestore. This will enable further radioactive decay to occur prior to their removal during Final Site Clearance.

Quiescence phase

2.4.44. No operational ILW and no decommissioning ILW is expected to arise during the Quiescence phase.

Final Site Clearance phase

2.4.45. Final Site Clearance will involve the removal of all remaining operational ILW from the Site which will have been stored in the debris vaults during the Quiescence phase, as well as the removal of decommissioning ILW produced during the removal of the reactor and other plant within the Safestore.

2.4.46. As outlined in **Section 2.4**, a new DWMC will be constructed to process and package the ILW generated from dismantling of the elements of the power station retained in the Safestore and retrieved from the HADV during this phase. The current estimates of the volume of ILW to be processed during Final Site Clearance are provided in **Table 2-8** Waste characterisation will be undertaken closer to the time of these works which may lead to changes in how the wastes are processed packaged and eventually stored or disposed of.

Table 2-8 - Current estimates of ILW volumes for disposal during Final Site Clearance

Origin	Volume as Arising (m3)	Typical Physical Composition of the Waste
Stainless Steel (Reactor)	194	Stainless Steel
Mild Steel (Reactor)	591	Mild steel items
Graphite	1831	Solid graphite moderator blocks which form the reactor core.
Miscellaneous activated components (1)	719	Miscellaneous items including metals, plastics, organics and in-organics.

Note to **Table 2-8**: 1. MAC is operational waste from fuel stringer dismantling which will be retrieved from the reactor voids for conditioning and packaging during Final Site Clearance. 2. The number and type of packages is likely to change in the interim as further studies are undertaken regarding the best methodology for disposal and packaging of ILW.

Radioactive Discharges to the Environment

2.4.47. Radioactive disposals, including discharges to the environment, are controlled under the Radioactive Substances Act 1993[10] and subject to authorisations and limits set by the Environment Agency. As required by the RSA93, radioactive discharges must utilise BAT.

2.4.48. Liquid discharges during generation and then defueling at HPB are undertaken via permitted discharges at the CW Outfall. Currently all waste-water arising on-site that has the potential to be radioactively contaminated is transferred to the AETP, which will be one of the last items of plant to be decommissioned during the Preparations for Quiescence phase. Following treatment and checks on radioactivity, active effluent is periodically discharged to the Severn Estuary alongside cooling water.

Preparations for Quiescence phase

2.4.49. During the Preparations for Quiescence phase, active effluent will still be produced from on-site activities from sources including waste-water from cutting operations, decontamination operations and showers. As outlined above, the existing active effluent discharge process utilises cooling water flow through the CW system. To enable the CW System to be decommissioned it is required that alternate arrangements for active effluent discharge are provided through the Preparations for Quiescence phase. For the purposes of assessment, this is assumed to be delivered by the construction of a new pipe to carry active effluent from its current discharge point into the CW Tunnel, along the tunnel, through the CW Outfall and along the CW Concrete Channel to its end

[10] UK Government (1993). Radioactive Substances Act. (Online). Available at: https://www.legislation.gov.uk/ukpga/1993/12/contents. (Accessed June 2024)

point. This change to existing discharge arrangements requires a variation of the existing permit (EPR/CB3735DT) from the Environment Agency.

2.4.50. Where necessary, buildings and work areas with the potential for airborne radioactive contamination will have forced ventilation with exhaust air passing through high efficiency particulate filters as appropriate. Changes to current gaseous discharge arrangements will require authorisation by the Environment Agency.

2.4.51. Prior to the decommissioning of the AETP, alternative effluent treatment arrangements may be used to treat any remaining potentially radioactive liquids arising during the remainder of the Preparations for Quiescence phase.

2.4.52. In all instances, any discharges occurring within this phase are expected to be well within current authorised limits of existing permits.

Quiescence phase

2.4.53. During the Quiescence phase, there will be very low levels of radioactive discharges to the atmosphere from the reactor pressure vessels. It is expected that atmospheric discharges from the Site will be significantly lower compared to discharges that occurred when the reactors were operational and those anticipated during the Preparations for Quiescence phase. In all instances, any discharges occurring within this phase are expected to be well within current authorised limits of existing permits.

2.4.54. Under normal circumstances, no radioactive liquid effluent discharges are expected during the Quiescence phase.

Final Site Clearance phase

2.4.55. During Final Site Clearance, radioactive releases to atmosphere will derive principally from cutting processes. Aerosols produced will be locally vented and discharged following filtration. Radioactive effluent arisings will result from processes such as water drenching of cutting activities and will be processed utilising an alternative AETP and discharged in accordance with the Environmental Permitting (England and Wales) Regulations 2016[11].

[11] UK Government (2016). Environmental Permitting (England and Wales) Regulations 2016 (Online). Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents/made (Accessed July 2024).

Radioactive disposal and authorised transfer routes

2.4.56. Potential radioactive waste disposal routes are summarised in **Table 2-9**.

Table 2-9 - Off-site transfer and final radioactive waste destinations

Radioactive Wastes	Off-Site transfer and/or Final destination
Operational ILW processed during the Preparations for Quiescence phase	Stored in HPA ILW Store prior to movement to the Geological Disposal Facility
Decommissioning ILW processed during Final Site Clearance	Geological Disposal Facility Some could be re-categorised as LLW and processed accordingly
Solid combustible LLW	Incineration at permitted facilities, or disposal at Low Level Waste Repository (LLWR) or equivalent facility
Solid non-combustible LLW	Treated at metal treatment facilities or disposal at LLWR or equivalent facility

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3

Alternatives

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3 Alternatives

3.1.1. Under Regulation 5 of the EIADR, there is a requirement for a description to be provided of the 'reasonable alternatives' studied by the licensee in developing the decommissioning proposals assessed within the EIADR Environmental Statement.

3.1.2. This chapter describes the main alternatives to the proposed 'Early Safestore' decommissioning strategy that were considered for decommissioning Hinkley Point B Nuclear Power Station (HPB). This chapter therefore outlines:

- the potential methods of reactor decommissioning;
- the analysis of the options considered; and
- the summary of the strategy selection process.

3.1.3. Also described are the main alternatives considered and the reasons for the chosen option for specific aspects of the decommissioning project, including:

- timing of demolition activities;
- approach to waste management facilities;
- active effluent discharge during decommissioning;
- Void Management;
- transport of waste and materials;
- Safestore appearance; and
- the Site end-states.

3.1.4. This chapter provides an outline of the main alternatives relating to the Proposed Works studied by the Applicant, together with an indication of the main reasons for the choices made. Environmental considerations are discussed where relevant.

3.1.5. It should be noted that the decisions discussed in this chapter will be regularly reviewed as part of efforts to ensure the decommissioning activities are cost and programme efficient, as well as maintaining any radioactive emissions to the public As Low As Reasonably Practicable (ALARP). It is therefore conceivable that a change to the Proposed Works described and assessed in this statement may be proposed following receipt of decommissioning consent under the EIADR. This could feasibly arise in relation to a number of matters, as the decommissioning plans become more developed. If any change which may have a significant effect on the environment were to be proposed, then Regulation 13 of EIADR would apply and further submissions for consent would be required from the ONR.

3.2 Decommissioning strategy

Decommissioning approaches considered

3.2.1. The preferred decommissioning strategy has been developed by the Applicant, in accordance with the requirements of License Condition (LC) 35 of each site's Nuclear Site Licence, following assessment of various decommissioning options that could be undertaken on the British Advanced Gas-cooled Reactor (AGR) power station fleet. As licence holders for the AGR sites, the Applicant has an ongoing obligation under Nuclear Site LC 35 to maintain a current decommissioning strategy and plan; this includes review of the currency of the strategy. Thus, the Applicant has conducted a number of strategy reviews in the past.

3.2.2. As part of the most recent study, the primary objective was "to progressively reduce and remove the hazard on the Site while:

- ensuring continued safety;
- minimising the environmental impact as far as reasonably achievable;
- decommissioning the station as soon as it is reasonably practicable to do so to release land from nuclear regulation for other use as appropriate; and
- ensuring value for money in the expenditure of resources on decommissioning."

3.2.3. In order to adequately manage the decommissioning process and prepare plans and proposals for the decommissioning of each station, in accordance with the objectives outlined above, the following principles were specified:

- the safety of the public, staff and plant, and the protection of the environment, is of paramount importance throughout all decommissioning activities;
- decommissioning wastes will be managed in accordance with a sustainable approach to waste management;
- full cognisance will be taken of all relevant legislation, regulations and guidance in the management of decommissioning;
- financial provisions for decommissioning will be made in accordance with the liabilities management agreements;
- resources and records will be maintained to enable the safe, efficient decommissioning of the AGR nuclear power stations; and
- strategies, plans and programmes for decommissioning will be prepared, developed and periodically reviewed.

3.2.4. The AGR decommissioning strategy is kept under review, to reflect any significant relevant developments in aspects including regulatory position, official guidance, industry experience, technical developments and business context. Previous studies have identified the preferred option as 'Early Safestore' which is an approach that relies upon the removal of the conventional power station infrastructure from the Site as rapidly as practicable and the construction of a Safestore as soon as practicable after the End of Generation, to allow entry into a long period of Quiescence prior to Final Site Clearance.

3.2.5. The most recent review in 2023 of the overall decommissioning strategy evaluated all decommissioning approaches that could be considered for the AGR fleet, generating a 'long-list' of potential options for decommissioning approach for consideration that are representative of previous studies. These are outlined in **Table 3-1**.

Table 3-1 - Long-list of decommissioning options

Option number		Title/summary of option
Option 0	Option 0a	Abandonment
	Option 0b	Fund-led deconstruction
Option 1	Option 1a	Minimum compliance / asset care
	Option 1b	Minimum Compliance/Asset Care until dismantling at T+85 years
	Option 1c	In-situ decommissioning / entombment
Option 2		Prompt reactor dismantling and Final Site Clearance
Option 3	Option 3a	Continuous but deferred dismantling
	Option 3b	Deferred dismantling with short quiet period of asset care, no Safestore
Option 4 - Safestore	Option 4A	Early Safestore Strategy (ESS) with deferral of reactor dismantling and Final Site Clearance, and prompt entry to the Quiescence phase with a short quiescent period
	Option 4B	Deferred dismantling with Early Safestore This is the current baseline AGR decommissioning strategy
	Option 4C	Early Safestore Strategy (ESS) with deferral of reactor dismantling and Final Site Clearance, and prompt entry to the Quiescence phase for an extended period based on conservative assessment of reactor dismantling dose rates
	Option 4D	Safestore strategy with deferral of reactor dismantling and Final Site Clearance, and deferred entry to a short Quiescence phase
	Option 4E	Deferred dismantling with a slower Preparations for Quiescence phase and Safestore

Option number		Title/summary of option
	Option 4F	Safestore strategy with deferral of reactor dismantling and Final Site Clearance, and deferred entry to the Quiescence phase for an extended period based on conservative assessment of reactor dismantling dose rates

3.2.6. Of these long-list options, the optioneering process pre-screened out numerous options. The options pre-screened out and the reasons for this are outlined in **Table 3-2**.

Table 3-2 - Options pre-screened for elimination

Option	Summary of option	Why it is not considered further
Option 0A - Abandonment	After completion of defueling, no further decommissioning work would take place, nor any other work on the Site.	This approach is not considered credible, because it would not deliver the decommissioning objectives; it would neither maintain safety nor reduce hazards on the Site.
Option 0B - Fund-led deconstruction	"Fund-led deconstruction" is the situation where the decommissioning strategy and plan is set dependent upon funding availability.	This is not relevant for the AGRs, as the AGRs will have access to the Nuclear Liabilities Fund (NLF) for their decommissioning. While the details of how that will be managed for Nuclear Restoration Services (NRS) are to be finalised, access to the NLF will relieve funding constraints.
Option 1A - Minimum compliance / asset care	In this option, no further decommissioning work would take place on the Site after defueling. Only the minimum asset management work required to maintain baseline health and safety standards would be carried out; this would maintain the then-extant condition of the Site and structures but would involve no change.	Because this option has no defined end point, there would be no prospect to release land on the Site for other uses. Cumulative costs for asset care would be expected to increase exponentially as the structures aged and would eventually become prohibitive. Simple application of this approach would merely exhaust the NLF with no actual deconstruction having taken place. This approach is not considered credible, because it would not deliver the decommissioning objectives: it would not reduce hazards on the Site and would prevent the Site from being released from regulatory control for other use.

Option	Summary of option	Why it is not considered further
Option 1C – Entombment / in-situ decommissioning	In-situ decommissioning, also referred to as 'entombment or 'mounding' is a decommissioning process by which the main buildings containing radioactive materials after defueling, for example the reactors, are in-filled with cementitious grout or other material to eliminate any voids prior to being buried under an engineered mound.	The relevant primary IAEA Safety Standards document, GSR Part 6[1], does not currently consider this to be a decommissioning strategy and explicitly rules it out as an option in the case of planned permanent shutdown and that it may only be considered a solution in the event of a severe accident. This approach is not considered credible at this time, as it would not deliver the objectives or meet current government policy requirements.

3.2.7. Following the option pre-screening exercise, the remaining options were analysed for their suitability in turn. It was decided to consider the six Safestore options as two groups of three, corresponding to the difference in time to reach the commencement of the Quiescence phase after End of Generation, with the duration of the Quiescence phase giving variations of those two basic classes. Further discussion of this is outlined below compared against a baseline of the preferred approach (as set out in **Chapter 2: The Decommissioning Process**).

Option 1b - Minimum compliance/asset care until dismantling at T+85 years

3.2.8. In this scenario, after completion of defueling, no further decommissioning work would take place on the Site until 85 years after End of Generation. Only the minimum asset management work required to maintain baseline health and safety standards would be carried out between the end of defueling and Final Site Clearance. This would maintain the then-extant condition of the Site and structures but would involve no change. After that period, the Site would be re-established and a complete decontamination, deplanting, demolition, reactor dismantling, and site clearance exercise would take place.

3.2.9. Doses and waste quantities are essentially the same as the baseline (i.e. the preferred approach set out in **Chapter 2: The Decommissioning Process**), however this waste is entirely generated during Final Site Clearance. The overall cost would be significantly higher than the baseline because of the need to maintain the whole site; there is a significantly higher on-going annual asset management effort and cost.

3.2.10. This option was discounted at this stage for the following reasons:

- no active hazard reduction with the only radiological hazard reduction occurring due to decay of the radioactive materials, rather than through proactive control of the wastes;

[1] International Atomic Energy Agency (2014). IAEA Safety Standards, General Safety Requirements Part 6, No. GSR Part 6, "Decommissioning of Facilities". (Online). Available at: https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1652web-83896570.pdf (Accessed August 2023).

- significant safety risks associated with degradation of plant and structures on-site over time;
- potential increased complications for eventual demolition caused by fauna making use of station buildings as habitats in the interim prior to removal;
- no reduction in built form on the Site for an extended period despite majority of plant having no retained purpose;
- increased carbon emissions from need to maintain workforce and associated travel to site;
- increased cost; and
- likely not to be compliant with government policy due to the lack of planned effort to achieve hazard reduction as early as was reasonably practicable.

3.2.11. This option was discussed at optioneering but was subsequently identified as not credible due to the fact that it does not seem to be compliant with government policy that decommissioning should be undertaken to enable the reduction of site hazards.

Option 2 -prompt dismantling

3.2.12. In this scenario, decommissioning actions begin shortly after the permanent shutdown and defueling and continue with no quiescent period until the facility has been dismantled and the Site is cleared to a level that permits the facility to be released from regulatory control for unrestricted use or released with restrictions on its future use. In this scenario, work is driven so that the assumed duration of the whole cycle would be about 20 years. This duration is based on the initial deconstruction phase being similar to the Preparations for Quiescence phase (albeit without construction of a Safestore) and taking approximately 10 years, with a similar period of time for reactor dismantling and other Final Site Clearance activities following this. This is an ambitious timescale, of a similar timescale to the decommissioning of several nuclear power stations in the USA, albeit those were generally water reactors and thus hold a different decay curve and produce a reduced quantity of waste that requires long term disposal.

3.2.13. This approach is one of the two ‘standard’ strategies mentioned in the relevant IAEA Safety Standards document GSR Part 6. The Applicant considers this strategy appropriate for the Pressurised Water Reactor (PWR) station at Sizewell B. It can be noted that this strategy has not been applied in the UK for a commercial graphite-moderated, gas-cooled reactor over the envisaged timescales, which would make it a “first of a kind” activity.

3.2.14. The benefits of this approach include:

- hazard reduction takes place most rapidly after End of Generation;
- there is the shortest practicable period to reach Final Site Clearance and potential for release of land, though see below about the implications of a ILW disposal route not being available;
- asset care costs are reduced;
- continuous working on the Site means there is no requirement to re-establish the Site as a working area later; and
- continuous working on the Site maintains a Suitably Qualified Experienced Person (SQEP) workforce.

3.2.15. Factors against the use of this approach for the AGRs include:

- There are significant risk implications in terms of very high dose levels / dose rates during prompt dismantling of the reactor.
- Creation of large quantities of HAW (as ILW), and the associated increased difficulty of handling wastes with higher levels of activity, e.g. requiring shielded handling equipment and shielded waste packages, plus possible requirements for extra staff to deal with the more complex work.
- Absence of a disposal route for HAW in the near- to medium-term, i.e. a Geological Disposal Facility (GDF). Until such facilities are available, a large new ILW Store for reactor dismantling wastes would be needed on the Site, meaning that the full site would not be cleared.
- Uncertainties about the capacities and availability of waste disposal routes in the short-term to handle the higher waste quantities.
- Considerably higher overall costs (and discounted costs) than the Early Safestore approach, due to a large amount of complex work shortly after End of Generation.

3.2.16. Prompt dismantling is considered more applicable for PWRs than AGRs. It was however identified that some sites may have local situations that make earlier dismantling more attractive, and that it is still technically feasible as an approach but is likely to have a higher cost and have greater complexity due to higher dose rates.

Option 3a - continuous but deferred dismantling

3.2.17. This scenario is similar to Option 2 but proceeds at a slower pace overall so that the duration of the whole cycle could be several decades. This would include periods of greater and lesser activity during the process and assumes that reactor dismantling would commence approximately 40 years after End of Generation. For the purpose of optioneering assessment, it was assumed that a GDF is available by approximately 2060 to receive AGR reactor dismantling wastes, and thus not necessitate the need for a new ILW Store on the Site which would otherwise increase the cost associated with this option.

3.2.18. The benefits of this approach were noted as:

- progressive, continual hazard reduction over time;
- work on some areas of the Site could be deferred slightly to undergo radioactive decay and thus make specific tasks simpler and lower-dose than under prompt dismantling;
- the assumed timing should reduce risks associated with non-availability of an ILW disposal route; and
- there is a continuous working presence on the Site so that there is no requirement to re-establish the Site as a working area later reducing the risk of loss of site knowledge.

3.2.19. Factors against the use of this approach included:

- While dose rates for reactor dismantling would be lower than under prompt dismantling, they would still be high compared to other options and there would be significant risk implications in terms of dose levels / dose rates during dismantling of the reactor.
- Creation of significant quantities of HAW (as ILW), and the associated increased difficulty of handling wastes with higher levels of activity.

- Possible requirement for extra staff to deal with the more complex work.
- Uncertainty over waste package type, as requirements for duration and location of waste storage have not yet been finalised.
- A delay in the provision of a GDF could affect this option, by requiring additional ILW stores to be constructed. Thus, there is significant reliance upon external suppliers.
- There are greater Asset Care costs over a longer period than for prompt dismantling.

3.2.20. Overall, it was identified that this option could be technically feasible but is likely to be associated with significantly higher cost than other technically feasible options.

Option 3b - Deferred dismantling with short quiet period of asset care, no Safestore

3.2.21. In this scenario, Preparations for Quiescence would include large-scale deplanting and deconstruction over 12-15 years without construction of a Safestore. The existing reactor building island would be placed under an asset care regime for approximately 25 years before commencement of reactor dismantling approximately 40 years after End of Generation.

3.2.22. The benefits and dis-benefits of this approach are similar to those outlined for Option 3a above but include the benefit of reduced asset care costs and increased hazard reduction over Option 3a.

Option 4b - Deferred dismantling with Early Safestore

3.2.23. This scenario is the option that has been the preferred approach to AGR decommissioning for some time following multiple reviews. In this scenario, after defueling, all or part of the facility containing radioactive material is either processed or placed in such a condition that it can be put in safe storage and the facility maintained until it is subsequently decontaminated and/or dismantled 85 years after End of Generation. Deferred dismantling may involve early dismantling of some parts of the facility and early processing of some radioactive material and its removal from the facility, as part of hazard reduction and preparatory steps for the safe storage of the remaining parts of the facility.

3.2.24. Options 4a and 4c rely on the same approach as 4b but provide options for the period of Quiescence ±20 years.

3.2.25. The benefits of the deferred dismantling with Safestore approach identified included:

- deferral of reactor dismantling reduces the dose rates associated with that work;
- deferral allows radioactive decay to make a reduction in the quantity and level of radioactive waste arising from decommissioning which reduced the size of interim storage facilities required;
- deferral allows time for disposal routes to be established; and
- funding provision for the whole decommissioning lifecycle is made more secure due to the quiescent period when fund recovery growth can take place.

3.2.26. Factors against the use of this approach include:

- the overall time to site clearance and release of land is greater than for earlier dismantling (such as options 2, 3a and 3b); and
- there is a need for Asset Care of the Safestore and interim waste storage facilities during the Quiescence phase.

3.2.27. Reactor dismantling commencing 85 years after End of Generation was selected as it limits dose to workers involved in the reactor dismantling work to certain levels comparable to the current company dose restriction level and was therefore considered as ALARP in earlier decommissioning studies. While dose is very important, it is not a simple process to define an ALARP dismantling dose at this point. Thus, the 85 years figure is taken as a good starting point to allow refinement for each reactor i.e. some variation to the Quiescence phase duration as seen in Options 4a and 4c. In addition to dose, like other options, the availability and type of ILW storage could be key in defining the correct length of Quiescence phase for options under this broader category.

3.2.28. Option 4b was identified to remain a very credible option for the decommissioning approach for the AGR fleet.

Option 4e Deferred dismantling with slower entry to the Quiescence phase with Safestore

3.2.29. This scenario is very similar to the scenario outlined above but assumes a deliberate decision to apply a longer less intensive period for the Preparations for Quiescence phase due to the complexity of works in this period or other external factors influencing optimum timescales. Options 4d and 4f are similar to Option 4e but consider shorter and longer periods of quiescence respectively.

3.2.30. The benefits and dis-benefits are similar to Option 4b, with the differences being that this approach may increase asset care costs prior to demolition, but that this may be counter-acted by greater hazard reduction prior to entry to the Quiescence phase and greater efficiencies to be found in decommissioning across the fleet to smooth resourcing.

Conclusions of the decommissioning strategy review

3.2.31. Whilst the review identified numerous potentially suitable options for decommissioning, the existing decommissioning strategy of 'Early Safestore' which aligns to Option 4b was still deemed credible and preferable based on information available at the time. The review acknowledges however the ambitious nature of this plan, and that decommissioning more akin to option 4e may arise as site specific decommissioning plans develop further. The site licensee will continue to maintain and develop its overarching decommissioning strategy to comply with nuclear site licence condition 35 in the future.

3.3 Waste management facilities in the Preparations for Quiescence phase

3.3.1. To facilitate the delivery of all AGR stations into a quiescent state, the need for the following waste management and storage facilities was identified:

- Decommissioning Waste Processing Facility (DWPF);
- Operational Waste Processing Facility (OWPF); and
- Interim ILW Store (ILW Store).

3.3.2. These were originally anticipated to be new build facilities at all AGR sites as part of the Baseline Decommissioning Plan 2016 (BDP16). However, opportunities were identified as part of BDP16 that these facilities could be re-used/repurposed (rather than new build), and use of shared facilities with adjacent NRS sites (i.e. Hinkley Point A (HPA)) should be considered. Optioneering has been performed on all 3 facilities to date and the current assumptions and alternatives considered are summarised below.

ILW storage

3.3.3. There is currently no suitable storage facility in line with Government's Higher-activity Radioactive Waste Policy and Implementation Strategy available to store HAW. The requirement of the Early Safestore strategy to process some operational HAW during the Preparations for Quiescence generates the need for storage of ILW packages on-site.

Consolidation of Intermediate Level Waste (ILW) storage across HPA and HPB has been recognised as an opportunity to optimise Baseline Decommissioning Plans for several decades. Historically, it was deemed prudent for the HPB decommissioning plans to allow for a dedicated HPB Interim Conditioned Intermediate Level Waste Store (ICILWS) as this kept plan conservative for provisioning purposes and kept control of the decommissioning programme with the Site Licensee.

3.3.4. As HPB approached the end of the generating phase of the station lifecycle, a series of studies were completed to develop and optimise the detailed plan for implementation of an ILW storage capability. Options considered were to utilise a new build facility on the HPB site to store ILW from HPB, or to utilise the existing HPA ILWS to store ILW from HPB.

3.3.5. These ILW Store options were appraised against safety, technical, environmental, socio-economic, regulatory and security criteria. The appraisal concluded that the preferred option, in light of potential reduced environmental impacts, cost and carbon savings was to store ILW within the HPA ILW Store, after processing on the HPB Site within its own OWPF. Further work is ongoing to consider the most appropriate waste processing and packaging solution.

3.3.6. An agreement has been reached by the Senior Strategic Committee that waste from HPB will be stored in the HPA ILW store. To that end, there is no requirement for a new purpose-built facility at HPB. The packaged HAW will be stored until an appropriate disposal facility becomes available beyond quiescence (the GDF is expected to be available ~ 2050-2060[2]) this is subject to further regulatory and local authority approval.

3.3.7. The key environmental factors associated with this decision included:

- it is considered to be sufficient capacity in the HPA ILW store to receive and store HPB ILW;
- reduced carbon impact under the 'build less' principle as substantial embedded carbon in the production of materials for construction were not required;
- reduction in built form on the HPB Site through the Quiescence phase with only the Safestore now required through this phase;
- reduction in noise and air quality emissions associated with ILW store construction; and
- overall reduction in conventional wastes produced as the HPB ICILWS would eventually require decommissioning and removal from site.

2 UK Government (2024). Geological Disposal Facility. (Online). Available at: https://www.gov.uk/guidance/geological-disposal (Accessed August 2024).

Decommissioning Waste Processing Facility

3.3.8. As outlined in **Chapter 2: The Decommissioning Process**, due to deplanting within radiation-controlled areas of the Site during the Preparations for Quiescence phase, there is an increase in waste that is potentially contaminated. This necessitates the creation of a Decommissioning Waste Processing Facility (DWPF) to process and package all Low Level Waste (LLW) so it can be consigned off-site as appropriate. An options appraisal is ongoing to review options to either construct a new DWPF building or to refurbish and adapt existing buildings for the use as a DWPF, which will consider viability, programme and environmental impacts.

3.3.9. In terms of the option to construction a new DWPF building with the Site, it is proposed that it will be located in the preferred location shown on **Figure 2.3;** i.e. the existing contractor's compound. This option necessitated the need for early demolition works to create space for the new facility. The building was anticipated to be a metal-clad portal frame structure on a concrete floor, with a maximum footprint of approximately 2,000 m^2 and up to 10 m in height.

3.3.10. As the options appraisal is ongoing, for the purposes of this EIADR assessment, it has been assumed that a new build facility will be required, this is considered to be a reasonable worst case environmental assessment basis.

Operational Waste Processing Facility

3.3.11. An Operational Waste Processing Facility (OWPF) is required for dealing with Higher Activity Wastes (HAW) as part of decommissioning such as sludges and resins from the Active Effluent Treatment Plant (AETP) system, carbonaceous debris from the pond, Miscellaneous Contaminated Items from deplanting and the gas bypass plant.

3.3.12. The baseline assumption for the OWPF was that a new build facility was required with a footprint of approximately 1,500 m^2. This assumption was produced with limited data and knowledge about the waste types and the waste processing and disposal routes that are now available to HPB. Other nuclear industry establishments have built new facilities where the existing facilities have been in poor condition or space was limited. However, HPB has the benefit of plant areas and buildings in good condition that will last for the duration of the short decommissioning phase to the point of the entry to the Quiescence phase. In addition, the strategy did not account for HAW that may become LLW within a few years of the Quiescence phase i.e. did not include areas for decay storage.

3.3.13. An optioneering study was commissioned by the Applicant to examine whether a new build OWPF may be required, or whether existing facilities on the Site could be refurbished / repurposed to house the waste processing plant required to process HAW.

3.3.14. The optioneering appraisal is ongoing, so for the purposes of this EIADR assessment, it is assumed that a new build facility will be required. This is considered to provide a reasonable worst-case environmental assessment.

3.4 Active Effluent Discharge

3.4.1. As outlined in **Chapter 2: The Decommissioning Process,** active liquid effluent from HPB and HPA discharge into the sea via the Cooling Water (CW) Outfall where the active effluent is diluted and mixed with cooling water from the CW system.

3.4.2. The current radioactive substances effluent discharge permit (EPR/CB3735DT), via the discharge point adjacent to the seawall has no flow requirement. The permit discharge is however limited by activity and particle size.

3.4.3. The primary function of the CW system, to provide cooling to the turbine condensers, will no longer be relevant at the end of generation. There are however several secondary functions that are still required during defueling. Once these secondary functions of the CW system are no longer required, new arrangements to ensure liquid effluents are discharged to sea will be required to avoid disproportionate costs and carbon emissions as a result of running and maintaining these pumps, as well as allowing decommissioning of the CW System and Turbine Hall.

3.4.4. As activities such as Active Area Deplanting will require continued discharge of active effluents throughout the Preparations for Quiescence phase, new discharge arrangements, namely the new Active Effluent Discharge Line (AEDL) are required to be installed prior to the turning off of the CW Pumps to enable CW System decommissioning.

3.4.5. Optioneering studies, such as dispersion modelling are ongoing, with a view to define the best practical means for delivering the AEDL. These studies will ascertain whether routing to the existing outfall location provides sufficient dispersion of effluents within the tidal cycle, or whether a ~220 m extension beyond the outfall to the end of outfall channel into the Severn Estuary is required. For the purpose of this assessment, the latter has been assessed as the reasonable worst-case due to the increased potential for work in the intertidal environment.

3.5 Void management

3.5.1. Studies looking to set a general fleet approach to decommissioning identified that decommissioning works would result in significant voids on-site during the Preparations for Quiescence and Final Site Clearance phases. Buildings such as the Turbine Hall were noted to have significant basements, whilst the decommissioning of the CW system was also identified as creating significant voids on-site. This was identified as presenting challenges for the decommissioning programme as leaving the voids in-situ was identified to:

- provide a potential safety hazard on-site;
- provide potential water management and water quality issues;
- lead to an increased maintenance burden through the Quiescence phase;
- be potentially considered un-acceptable to the local public; and
- potentially be mis-aligned to requirements to de-license the Site at the end of decommissioning.

3.5.2. An opportunity was identified that voids on-site could be filled, or partially filled, with suitable material generated from the deconstruction activities. However, it was identified that it would be unlikely that enough suitable fill material would be generated in the Preparations for Quiescence phase to fill voids entirely prior to the long period of Quiescence. With this in mind, a high-level optioneering assessment was undertaken across the AGR fleet to consider whether the general assumption prior to site specific analysis on the void management strategy should be to:

- Option A – Completely fill voids created in the Preparations for Quiescence phase with a combination of site-won material and additional imported material to reduce the management burden through the Quiescence phase.

- Option B – Leave voids that can't be filled using site won material during the Quiescence phase and manage accordingly. There may therefore be a combination of filled partially filled and empty voids to manage during Quiescence.

3.5.3. It was identified as part of this work that considering the full lifecycle of the Site is important in decision making, as the decision to import material during the Preparations for Quiescence phase would be likely to cause the need to export rubble material from the Site during Final Site Clearance. Likewise, the need to manage ongoing voids on-site would potentially require management for a long period during the Quiescence phase. The benefits and dis-benefits of each option identified by the high-level assessment are outlined in **Table 3-3**.

Table 3-3 - Comparative review of options

	Benefits	Dis-benefits
Option A	Reduced maintenance burden during Quiescence phase	Increased cost to import and export material during the relevant phases
		Increased traffic movements and associated increase in environmental impacts from noise and traffic emissions to bring material to and from site
	Increased safety as removes the hazard of the void on-site which would be balanced by potential safety risks whilst undertaking void filling works.	Increased carbon emissions to import and export material
		Opposition from public due to increased near-term traffic impacts
		Reduced impact on local fill material resources
Option B	Reduced cost – Savings to be made from both not importing material but also having a location for Final Site Clearance generated fill material to be utilised on site.	Reduction in long-term safety on the Site compared to Option A but reduction in safety risks associated with void filling activities
	Reduction in carbon emissions from: Transport of materials (import and export), handling of materials on-site and quarrying of infill material.	Will require greater modifications to site drainage systems including potential requirement for pumping systems over a long time period
	Reduced traffic movements and therefore reduction in traffic related noise and emissions of NO_2	Potential impact on water quality from creating standing water that may increase groundwater impacts
		Visual impact of un-filled voids may generate public opposition to the approach

3.5.4. This initial optioneering assessment outlined that despite the challenges regarding safety and technical delivery for Option B, it was likely that these were largely mitigatable and represented significant cost savings, carbon savings and other environmental benefits over Option A. It was therefore decided that leaving voids in-situ would become the 'baseline' assumption for the AGR sites subject to further site specific Void Management Strategies being developed.

3.5.5. At HPB, it is estimated that the Preparations for Quiescence phase, will create[3] approximately 77,000 m^3 of voids associated with the Proposed Works. Across the Preparations for Quiescence phase, by nature of the type of structures at HPB and as demolitions will generally be undertaken only to ground level, it is estimated that deplanting and demolition activities could generate approximately 21,600 tonnes of clean rubble that should be suitable for use as infill material. Using experience from previous decommissioning activities, a conservative estimate of 25% of this figure has been assumed to be not suitable for use which leaves approximately 16,200 tonnes for use as infill. Re-using this material on-site has the benefit of removing additional HGVs from the local highway network and is therefore deemed the most sustainable approach subject to design of void infilling to prevent impacts on local groundwater. The potential environmental impacts of this re-use of materials as infill material on groundwater quality is considered in the assessment in **Chapter 12: Soils, Geology and Hydrogeology**.

3.5.6. Whilst using this material as infill is of benefit to the Proposed Works, it is still anticipated that there is approximately 68,500 m^3 shortfall in site won material to use as infill in the Preparations for Quiescence phase. Should off-site infill material be required to be delivered to site, this would equate to approximately 13,500 HGV movements (two way) on the highway network.

3.5.7. During Final Site Clearance, decommissioning of the cooling pond, AETP and Debris Vaults are expected to create a further 7,200 m^3 of void. If voids are not filled during the Preparations for Quiescence phase and therefore retained through Quiescence, the total void at Final Site Clearance on-site would be 75,700 m^3.

3.5.8. The Final Site Clearance phase is expected to generate approximately 77,200 m^3 rubble at HPB. Replicating the assumption that 25% of site won rubble may not be suitable for re-use as infill material, this leaves approximately 57,900 m^3 material suitable to use as infill material at the Site during Final Site Clearance.

3.5.9. A Void Management Strategy will be developed in the future to identify and implement suitable measures that will be embedded in the design to prevent effects on surface water and groundwater quality and to reduce any potential safety hazards associated with retaining voids through the Quiescence phase.

3.6 Safestore

3.6.1. The key to the current decommissioning strategy at HPB is the requirement for a Safestore which allows for the Reactors, High Activity Debris Vaults (HADVs), Cooling ponds, AETP and other plant left in the reactor building following risk based deplanting to be kept in a good condition and monitored without on-site hands-on management.

3 All numbers quoted are rounded to nearest 100 m^3

3.6.2. An engineering assessment was undertaken during 2023 to evaluate the Safestore options to assist the Applicant in its strategy review for Safestore and assist development of the Site specific HPB decommissioning plan.

3.6.3. The optioneering process was commenced with a building walkdown, to understand the existing condition of the HPB reactor building and charge hall and adjoining structures which could then influence the options assessment.

The Options

3.6.4. The process considered a combination of engineering judgement and quantitative discussion where possible, to score options within a Multi Attribute Decision Analysis tool. The tool allows multiple types of attributes to be assessed and provides a weighted score. The options considered within the study were as follows:

- Option 1 – reduced height – new cladding;
- Option 2 – full height – new cladding;
- Option 3 - full height - full use of existing cladding; and
- Option 4 – reduced height – partial use of existing cladding.

Option 1 – reduced height – new cladding

3.6.5. This option requires the removal of all plant within the charge hall sitting above the reactor building including the fuel handling machine and the charge hall runway crane. This would allow for the whole charge hall structure to be removed, and a replacement roof to be constructed which would provide a reduced building volume and height.

3.6.6. The main structural framing of the building will remain, but some new additional secondary structural elements would be required to facilitate the addition of new cladding to the outside of the existing building. The cladding will be selected based on a requirement for it to provide necessary environmental control and longevity. It was assumed in the optioneering process that re-cladding would be an aluminium cladding solution as it would provide a long-life and would provide other benefits in assisting control of the internal environment. This option includes additional flood defence measures at the base of the Safestore building.

Option 2 - full height - new cladding

3.6.7. This option considers the retention of the charge hall in the event that removing the plant contained within this area is too difficult or provides too long a delay to the entry to the Quiescence phase. It involves the full re-cladding of the building, including the provision of some secondary support structures to facilitate adding this cladding. The assessment assumed it would use the same type of cladding as outlined for Option 1. This option includes additional flood defence measures at the base of the Safestore building.

Option 3 – full height – full use of existing cladding

3.6.8. This assumes the retention of the existing roof structures and the cladding on facades where practicable. The complete removal of all glass elements to the Charge Hall and Circulator Halls would be required in terms of continued safety, security, and control of internal environment and allows for the removal of the asbestos in the caulking, which equates to approximately 70% of existing façade cladding would require replacement or localised repair prior to entering the Quiescence phase, though the retention of the main structure offsets this initial cost.

3.6.9. Under this option, the opportunity to replace with cladding with greater longevity is possibly lost, and the cladding would therefore be expected to be replaced at least once during the Quiescence phase. The mix of new and existing cladding and roofing materials potentially compromises the ability of the building envelope to provide long term resistance to weathering and control of the internal environment. The complexity of the retained building potentially compromises the flow of background ventilation.

3.6.10. The retention of the existing façades would not offer effective flood-prevention measures without significant repair or replacement.

Option 4 – reduced height - partial use of existing cladding

3.6.11. This option involves similar structural rework to Option 1 and includes the removal of the Charge Hall. The demolition of the Charge Hall would require a high volume of demolition and assumes the removal of the Fuel Handling Machine. The removal of the glazing elements would be a complex process in terms of its scale and presence of asbestos but again, is applicable to all options.

3.6.12. The existing vertical cladding and the partial 3 m high reinforced concrete (RC) wall of the reactor building would be retained and infilled to provide a weatherproof façade.

3.6.13. The remaining area of Circulator Hall roof would most likely be impacted by the Charge Hall demolition works. Successful repair and infill of the roof would be challenging, both in terms of temporary protection and securing an effective warranty for the resulting roof.

3.6.14. The retention of the existing vertical cladding and protection wall for the majority of the Safestore places reliance on the effectiveness of the existing envelope to provide adequate air tightness and thermal resistance as well as overall weather protection to the internal structures. In particular, achieving airtightness to current standards would be impractical, as the original structure would not have been designed to provide this level of protection. There is, therefore, an element of risk of condensation causing premature deterioration of the retained elements.

The Options assessment

3.6.15. The four options were scored against multiple different factors within 4 broad categories, which are summarised in **Table 3-4**.

Table 3-4 - Options assessment categories

Category	Factors considered
Safety	▪ improved security of safety enclosure; ▪ reduction of significant demolition over reactor vessels; ▪ improvement of safety through control and removal of hazards; ▪ early removal of hazardous building materials; ▪ reduction to future maintenance and repair; and ▪ reduction of volume and extent of asset to be retained.
Technical	▪ buildability; ▪ simplicity of construction; ▪ low demolition requirement; ▪ control of internal environment; ▪ resistance to deterioration of Safestore envelope; ▪ ability to commence safestore before completion of deplanting; ▪ ability to retain fuel handling machine; ▪ ease of Final Site Clearance (FSC); and ▪ requirement for temporary shelter during FSC to remove long items from reactor core.
Environmental	▪ minimised carbon impact; ▪ reduction of materials requiring disposal; ▪ incorporation of flood prevention measures; ▪ robustness vs. long term hazards; ▪ appearance with regard to planning and improvement of business image; and ▪ ease of obtaining planning permission.
Economic	▪ reduction in construction costs; ▪ reduction of construction programme; ▪ reduction of demolition programme; ▪ maintenance requirements on cladding; ▪ reduction of time for ongoing maintenance; and ▪ plan simplicity during design phase.

3.6.16. The scoring process identified the below:

- Option 1 achieved the highest rating for safety and environmental considerations.
- Option 2 received the highest rating from a technical standpoint.
- Option 4 scored the highest from an economic standpoint albeit there were marginal differences between that and Option 1.
- Option 3 did not score highest in any categories.

3.6.17. The first EIADR consultation was undertaken in parallel with the optioneering process. As part of the consultation, numerous comments were received outlining the importance of the eventual colour of the Safestore and that this may have more significance than a reduced height structure. To understand the difference in visibility between the full height and reduced height options, a Zone of Theoretical Visibility (ZTV) study was undertaken. This is shown in **Figure 3.1**. This highlights that there is not a significant difference in visibility between a full height and reduced height Safestore.

Conclusion of Safestore study

3.6.18. The key differentiators between the different options included the ability to achieve a greater amount of hazard reduction and the reduction in costs to manage the asset through the Quiescence phase.

3.6.19. The optioneering process identified the highest scoring option as Option 1 as it scored highly on the technical and safety requirements for the Safestore, but also represented benefits of reduced carbon emissions and costs across the whole lifecycle compared to the two full height options.

3.6.20. Option 1 was therefore concluded to provide the most complete solution from a structural engineering perspective. However, work is ongoing to understand the complexity and feasibility of the Active Area Deplanting works to remove the fuel handling machine and other plant within the charge hall and to understand the extent and complexity of demolition/construction work required for each option. The feasibility of this needs to be considered relative to the intention to commence the Quiescence phase as soon as practicable and it is therefore not certain that the reduced height options in Option 1 and 4 are viable until the completion of this work.

3.6.21. For the purposes of the EIADR assessment, it is therefore assumed the Safestore would align with Option 2 which is the best scoring of the two full height options as this represents a reasonable worst case for assessment.

4

Policy and legislation overview

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4 Policy and legislation overview

4.1 Introduction

4.1.1. This chapter presents an overview of the legislative and policy context of relevance to the Environmental Impact Assessment (EIA) of the Proposed Works. Additionally, interactions with other consenting regimes are discussed.

4.1.2. Each environmental aspect chapter in this Environmental Statement (ES) (**Chapters 6** to **20**) includes aspect specific legislation, and a summary of the relevant policies and technical guidance where pertinent to the assessment. Legislation, policy and guidance has been used to define the scope of the EIA and to inform the value ascribed to relevant receptors.

4.1.3. Due to the long duration of the Proposed Works, consideration of developing Government policy and legislation, for the duration of the Proposed Works, will be maintained, and any relevant changes pertaining to the relevant activities and waste management will be reviewed and adhered to where required. It is anticipated that any change to the 'baseline' or environmental effects as a result of changing policy and legislation or a project change will be managed through EIADR (see **Appendix 5C**) or the legislation of relevance at that time.

4.2 Pre-application opinion

4.2.1. A Pre-application opinion was adopted by the ONR, on 07 December 2022. A summary of the relevant responses received in the Pre-application Opinion in relation to legislation, policy and technical guidance, and confirmation of how these have been addressed within the ES is presented in Table 4-1**.**

Table 4-1 - Summary of Pre-application opinion responses

Paragraph Ref.	Consideration	Addressed within the ES
31	Consultee comments noted that relevant local plans, such as the Somerset's School Place Planning Infrastructure Growth Plan and Local Plans for housing developments, could be considered in order to inform future baseline as they will include information on planned development in the local area.	The approach to other development is considered in the EIA either as future baseline as may be relevant to the assessment for each of the technical aspect chapters (**Chapters 6-20**) or as cumulative inter-relationship effects in **Chapter 21: Cumulative Effects Assessment (CEA)**. Where other developments are anticipated to be completed prior to the commencement of the Proposed Works, and the effects of those other developments are fully determined, these developments will be considered as part of the potential 'future baseline'.

Paragraph Ref.	Consideration	Addressed within the ES
		Somerset's School Place Planning Infrastructure Growth Plan and Local Plans for housing developments identify potential developments that may come forward. However, where no application has been made (and approved) and there is no certainty when such schemes would be completed, it is not appropriate to consider them as future baseline. Where development has been approved but would not be constructed or completed prior to the commencement of the Proposed Works, or identified as a potential development that consent would be sought for, these are considered within the CEA. The EIA therefore clearly distinguishes between other developments forming part of the future baseline and those that are addressed in the CEA.
44	Paragraph 3.2.3 of the scoping report sets out Directives that are relevant to the decommissioning project, however, it does not describe the interactions with the EIA carried out for the purposes of EIADR. In addition to this, the Habitats Regulations Assessment (HRA) is referred to in Table 8.7 but there is a lack of information on how the findings of this assessment will be considered in the EIA and reported in the ES. Regulation 4A of EIADR requires that the EIA is coordinated with assessments carried out under the Habitats Regulations.	Noted. Further detail on how the Directives are implemented into UK law is provided in **Table 4-2**. Appropriate signposting is made to the environmental aspect chapters which will include detail on the applicability of the UK legislation to the aspect assessments and the Proposed Works as a whole. Whilst HRA and EIA are two different legislative regimes, it is acknowledged that there is a relationship between the processes involved that support decision making. The EIA considers potential effects on both designated and non-designated habitats and species in relation to European Sites, and refers to the findings of the HRA, where applicable, such as **Chapter 8: Terrestrial Biodiversity and Ornithology**. Where applicable, the same evidence base will be referred to across all environmental aspect assessments, to ensure consistency in both approach and findings. Technical engagement has been held with Natural England to discuss the scope and

Paragraph Ref.	Consideration	Addressed within the ES
		assessment conclusions of the EIA and HRA (18 July 2024).
45	The ES should include a description of interactions with other relevant assessments (for example the HRA and Water Framework Directive), and other regulatory requirements (e.g. safety case documentation and environmental permits), for example where assessment findings have been shared and used.	The environmental aspect chapters (Chapters 6-20 of this ES) clearly identify interactions with assessments completed for other regulatory regimes. In addition, the interactions with other consenting regimes are discussed in **Table 4-3**..
54	There are a number of potential omissions in the Legislation, Policy and Guidance section of the scoping report (Chapter 3), for example, Conservation of Offshore Marine Habitats and Species Regulations 2017 and relevant policies in the Local Plan. A full review and consideration of relevant legislation, policy and guidance applicable to the EIA should be documented in the ES, including an explanation of why they are relevant and how they have been considered in the EIA.	The purpose of Tables 3.2 and 3.3 within Chapter 3 of the Scoping Report was to provide a holistic overview of the relevant national and local policies as opposed to citing specific policies which are of relevance to topic specific assessments. Specific details with respect to their relevance to the Proposed Works and topic assessments are provided in the environmental aspect chapters of the Scoping Report. This approach is replicated for the ES, where this chapter sets out the overarching legislation and policy relevant to the EIADR, with appropriate cross references to where further aspect specific information can be found. Consideration has been given to each environmental aspect area to ensure all relevant policies and legislation are included in the relevant chapter.
Appendix 2, Table row 8	The Scoping Report states that the OWPF [Operational Waste Processing Facility] and WMC [Waste Management Centre] will require planning permission through the TCPA, however this is less clear for the DWPF [Decommissioning Waste Processing Facility]. It is unclear if these works are also included in the scope of EIADR.	The assumption within this EIA is that a new building will be required to accommodate a Decommissioning Waste Processing Facility (DWPF) for which planning permission will be required under the Town and Country Planning Act 1990. It is currently anticipated that the construction of the DWPF will be undertaken in advance of EIADR consent being granted. However, the DWPF may still be under construction at this point and therefore as a worst-case assumption, the

Paragraph Ref.	Consideration	Addressed within the ES
		construction, operation and decommissioning of the DWPF has been assessed in this ES. The same approach is followed for the Operational Waste Processing Facility (OWPF) and Waste Management Centre (WMC).
Appendix 2, Table row 8	A Marine Licence including the removal of the intake and outfall structure are likely to be required. It is unclear how additional requirements under Marine Licensing will be managed where EIADR also applies.	The scope of the EIA, the outcome of which is reported in this ES, has been defined for the purposes of supporting the application for decommissioning consent under the EIADR. It is assumed that the marine licence application will draw on the EIADR application (ES, HRA and other supporting documentation), thereby ensuring consistency in approach and impact assessment outcome. However, it is noted that further detail on method of works in the marine environment may be required, which will be developed through detailed design. It is anticipated that additional conditions may be attached to the marine licence.

4.3 Withdrawal of the UK from the EU

4.3.1. UK Legislation is influenced by a variety of international agreements including European Union (EU) directives, regulations and agreements.

4.3.2. On 31 December 2020, the UK exited the EU following the expiry of the “transition period”, as provided for by the European Union (Withdrawal) Act 2018 (Withdrawal Act 2018)[1]. Sections 2-3 of the Withdrawal Act 2018, as amended, confirm that direct EU legislation, and EU-derived domestic legislation, continue to have effect in UK domestic law after that date. In summary, the interpretation of any retained EU law is to be the same as it was before that date, insofar as the retained EU law remains unmodified in UK law and regulations have not been made providing otherwise (s. 6(3) of the Withdrawal Act 2018).

4.3.3. The Directives, as they have been given effect in UK domestic legislation, are therefore relevant to the Proposed Works and are referred to where required in this ES, as shown in Table 4-2.

[1] UK Government (2018) *European Withdrawal Act 2018* (Online) Available at: www.legislation.gov.uk/ukpga/2018/16/contents/enacted (Accessed January 2024).

Table 4-2 - Overview of EU Directives and their implementation in UK and English Law relevant to the Proposed Works

EU Legislation	Implementation in UK and English Legislation	Environmental aspect ES Chapter where legislation is discussed further
Environmental Impact Assessment (EIA) Directive (2011/92/EU)[2] (as amended by EIA Directive 2014/52/EU)[3]	Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)[4]	Relevant consenting regime to the Proposed Works (see **Table 4-3**), against which all aspect ES chapters are assessed.
Habitats Directive (92/43/EEC) [5]	The Conservation (Natural Habitats & c.) Regulations 1994[6] The Conservation of Habitats and Species Regulations 2017 (as amended)[7]	**HRA Screening Appraisal**
Waste Framework Directive (2008/98/EC)[8]	Waste (England and Wales) Regulations 2011[9] (as amended)[10]	**Chapter 19: Conventional Waste**

[2] European Commission (2011). *Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0092&from=EN (Accessed August 2024) .

[3] European Commission (2014). *Directive 2014/52/EU of the European Parliament and of the Council of 16 November 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN (Accessed August 2024).

[4] UK Government (1999). *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999* (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024) .

[5] European Commission (1992*). Directive 92/43/EEC of the European Parliament and of the Council of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN (Accessed August 2024) .

[6] UK Government (1994). *The Conservation (Natural Habitats, &c.) Regulations 1994* (online). Available at: http://www.legislation.gov.uk/uksi/1994/2716/made (Accessed August 2024).

[7] UK Government (2010). *The Conservation of Habitats and Species Regulations 2010*. (Online). Available at: https://www.legislation.gov.uk/uksi/2010/490/contents/made (Accessed August 2024) .

[8] European Commission (2008). *Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098&from=EN (Accessed January 2024) .

[9] UK Government (2011) *Waste (England and Wales) Regulations 2011*. (Online) Available at: https://www.legislation.gov.uk/uksi/2011/988/contents/made (Accessed August 2024).

[10] UK Government (2013). Waste and Emissions Trading Act 2003 (Amendment etc.) Regulations 2013. Available at: The Waste and Emissions Trading Act 2003 (Amendment etc.) Regulations 2013 (legislation.gov.uk) (Accessed August 2024)

EU Legislation	Implementation in UK and English Legislation	Environmental aspect ES Chapter where legislation is discussed further
Industrial Emissions Directive (2010/75/EU)[11]	The Environmental Permitting (England and Wales) Regulations 2016[12]	**Chapter 6: Air Quality**
Air Quality Directive (2008/50/EC)[13]	The Air Quality Standards Regulations 2010[14]	**Chapter 6: Air Quality**
Birds Directive (2009/147/EC)[15]	The Conservation Habitats and Species Regulations 2017 (as amended)[7]	**Chapter 8: Terrestrial Biodiversity and Ornithology**
Environmental Liability Directive (2004/35/EC)[16]	The Environmental Damage (Prevention and Remediation) (England) Regulations 2015 (as amended)[17]	**Chapter 9: Marine Biodiversity**
Water Framework Directive (WFD) (2000/60/EC)[18]	The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[19] (as amended)[20]	**Appendix 10B: Water Framework Directive Appraisal**

[11] European Commission (2010). *Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emission*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32010L0075&from=EN (Accessed August 2024).

[12] UK Government (2018). The Environmental Permitting (England and Wales) Regulations 2018. Available at: The Environmental Permitting (England and Wales) (Amendment) Regulations 2018 (legislation.gov.uk) (Accessed August 2024)

[13] European Commission (2008). *Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0050&from=en (Accessed August 2024) .

[14] UK Government (2010). *The Air Quality Standards Regulations 2010*. (Online). Available at: https://www.legislation.gov.uk/uksi/2010/1001/contents/made (Accessed August 2024).

[15] European Commission (2009). *Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&from=EN (Accessed August 2024) .

[16] European Commission (2004). *Directive 2004/35/EC of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage*. (Online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32004L0035&from=EN (Accessed August 2024) .
UK Government (2015). *The Environmental Damage (Prevention and Remediation) (England) Regulations 2015* (Online). Available at: https://www.legislation.gov.uk/uksi/2015/810/contents (Accessed August 2024).

[18] European Commission (2000). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. (Online) Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF (Accessed August 2024).

[19] UK Government (2017) The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. (Online) Available at: https://www.legislation.gov.uk/uksi/2017/407/contents/made (Accessed August 2024).

[20] UK Government (2019). Floods and Water (Amendment Etc) (EU Exit) Regulations 2019. Available at: The Floods and Water (Amendment etc.) (EU Exit) Regulations 2019 (legislation.gov.uk). (Accessed August 2024).

EU Legislation	Implementation in UK and English Legislation	Environmental aspect ES Chapter where legislation is discussed further
EU Groundwater Directive (GWD) (2006/118/EC) 2006[21]	The Groundwater (Water Framework Directive) (England) Direction 2016[22]	**Chapter 12: Soils, Geology and Hydrogeology**
Floods Directive (2007/60/EC)[23]	The Flood Risk Regulations 2009[24]	**Appendix 11A: Flood Risk Assessment**
Marine Strategy Framework Directive 2008/56/EC[25]	Marine Strategy Regulations 2010[26]	**Chapter 9: Marine Biodiversity**

4.4 Overview of Relevant Legislative context

4.4.1. This ES has been prepared to be submitted to support the application to the ONR for consent for the Proposed Works, under the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR) (as amended). The Proposed Works to decommission Hinkley Point B Nuclear Power Station (HPB) will be undertaken and regulated in compliance not only with the EIADR, but with other relevant security, health, safety and environmental protection legislation including:

- Health and Safety at Work (etc.) Act 1974;
- Nuclear Installations Act 1965 (as amended);
- The Management of Health and Safety at Work Regulations 1999;
- The Construction (Design and Management) Regulations 2015;
- The Ionising Radiation Regulations 2017; and
- Environmental Protection Act 1990.

4.4.2. Appropriate plans, risk assessments and control measures, will be required under such legislation, and where relevant to the assessment in this ES, cross references are made (in **Chapters 6** to **20**). Consent to begin decommissioning under EIADR does not remove any such duties from the Nuclear

[21] Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0118. [online]. (Accessed August 2024)

[22] The Groundwater (Water Framework Directive) (England) Direction 2016. Available at: https://www.gov.uk/government/publications/the-groundwater-water-framework-directive-england-direction-2016. [online]. (Accessed August 2024)

[23] European Environment Agency (2007). Floods Directive 2007/60/EC [Online]. Available at: https://www.eea.europa.eu/themes/water/interactive/by-category/floods-directive (Accessed August 2024)

[24] UK Government (2009). The Flood Risk Regulations [Online]. Available at: https://www.legislation.gov.uk/uksi/2009/3042/contents/made (Accessed August 2024)

[25] European Commission (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive) (online) Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008L0056 (Accessed August 2024)

[26] UK Government (2010). The Marine Strategy Regulations 2010. (Online) Available at: https://www.legislation.gov.uk/uksi/2010/1627/contents/made (Accessed August 2024)

Site Licensee, nor does this in anyway restrict or otherwise limit the ability of other regulators to fulfil their statutory duties.

4.4.3. Some assessment of the environmental effects that may arise from the Proposed Works may fall within the scope of other legislative and consenting frameworks in addition to the EIADR. Table 4-3 summarises the scope of Proposed Works where the assessment of environmental effects is also covered by other legislative and consenting frameworks, and as such there are interfaces with the EIADR.

Table 4-3 - Overview of consenting regimes and associated works

Consenting regime	Associated works
The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[27]	Dismantling and decommissioning works for HPB (excluding the removal of fuel from the reactors, and the management of waste arisings and decontamination where such activities are undertaken as part of normal operations) for the purpose of permanently preventing the continued operation of that station.
The Town and Country Planning Act 1990[28]	The construction and operation of a Decommissioning Waste Processing Facility (DWPF) will require a separate planning application for determination by Somerset Council (SC) under the Town and Country Planning Act 1990 (TCPA)[12]. It may also require an EIA under the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 [29] (TCPA EIA Regulations). Additionally, if a new Operational Waste Processing Facility (OWPF) is necessary, a separate planning application for determination by SC would be required (see **Chapter 2: The Decommissioning Process** for further details). Details of the WMC to be required in the Final Site Clearance Phase of the Proposed Works are not yet known. Where required, appropriate permissions will be sought, relevant to the consenting regime at that time, in advance of this facility being needed. Planning applications under the Town and Country Planning Act 1990 may also be required for the following activities within the decommissioning process: ▪ Construction and operation of temporary welfare accommodation to facilitate deconstruction and

[27] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

[28] UK Government (1990). The Town and Country Planning Act 1990. (online) Available at: Town and Country Planning Act 1990 (legislation.gov.uk) (Accessed August 2024).

[29] UK Government. (2017). The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. (online) Available at: https://www.legislation.gov.uk/uksi/2017/571/contents/made (Accessed August 2024).

Consenting regime	Associated works
	remediation works in the Preparation for Quiescence phase and Final Site Clearance phase; ■ Construction and operation of the Safestore; and ■ Construction and operation of any Waste Management Centre to support Final Site Clearance.
The Marine and Coastal Access Act 2009[30]	The Marine and Coastal Access Act 2009 defines arrangements for a system of marine management, including the introduction of marine planning, across the UK. The Marine Management Organisation (MMO) delivers UK marine policy objectives for English waters through a series of statutory Marine Plans and other measures. The Proposed Works that are likely to require a Marine Licence include the removal of the intake and outfall structures on top of the seabed in the Severn Estuary and the potential for the construction of a new effluent discharge line. An application for a Marine Licence may require supporting information under the WFD[31], Conservation of Habitats and Species Regulations 2017[32] and the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)[33].
Conservation of Habitats and Species Regulations 2017[34]	Where the Proposed Works directly or indirectly affect an internationally/nationally significant ecological designation, a separate assessment of potential effects must be carried out under the Conservation of Habitats and Species Regulations 2017 (the Habitat Regulations). A Habitat Regulations Assessment (HRA) Screening Report accompanies this ES which will inform the ONR of the need for an Appropriate Assessment to be undertaken by the ONR, as the Competent Authority under the Habitat Regulations. In consultation with the Environment Agency and Natural England, the ONR will consider whether the findings of no significant effects on the integrity of internationally/nationally significant ecological designations that are reported in the HRA Screening Report is accepted. If further assessment is

[30] UK Government. (2009). Marine and Coastal Access Act 2009. (online) Available at: https://www.legislation.gov.uk/ukpga/2009/23/contents (Accessed August 2024).

[31] UK Government. (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. online) Available at: https://www.legislation.gov.uk/uksi/2017/407/contents/made (Accessed August 2024).

[33] UK Government. (2007). The Marine Works (Environmental Impact Assessment) Regulations 2007. (online) Available at: https://www.legislation.gov.uk/uksi/2007/1518/contents/made (Accessed August 2024).

[34] UK Government. (2017). The Conservation of Habitats and Species Regulations 2017. (online) Available at: https://www.legislation.gov.uk/uksi/2017/1012/contents/made (Accessed August 2024).

Consenting regime	Associated works
	required, in accordance with the Habitat Regulations the ONR must have regard to the findings of their Appropriate Assessment in exercising its function under the EIADR.
Water Framework Directive[28]	For activities in the marine environment up to 1 nautical mile out to sea, assessment and approval may be required where there is a potential effect on the immediate and any linked water bodies and to ensure compliance with the relevant river basin management plan. As part of this application under the EIADR, a Water Framework Directive (WFD) assessment has been included for the consideration of the ONR and other relevant stakeholders (notably the Environment Agency) with respect to the regulation and consenting of the Proposed Works.
Environmental Permitting Regulations 2016 (as Amended)	Under environmental permitting, certain operators are required to apply for permits for some facilities or exemptions for others. For new or variations to permits that may be required for activities that could harm the environment or human health, including, but not limited to: · Water discharge activities. · Groundwater activities. · Flood risk activities. · Waste operations, including any disposal of radioactive and non-radioactive wastes

4.4.4. Any topic specific legislation is discussed within **Chapters 6** to **20**.

4.1 National planning policy

Introduction

4.1.1 The EIA will consider national policy, which is relevant to the Proposed Works, as summarised in **Table 4-4.** Where these national policies are relevant to specific technical aspects, they will be discussed further in **Chapters 6 – 20** of this ES.

Table 4-4 - Relevant national policy

Policy	Summary
Overarching policy	
Nuclear Decommissioning Authority Strategy 2021[35]	The 2021 strategy sets out the UK's strategy *'to deliver safe, secure, sustainable and publicly acceptable solutions to the challenge of nuclear clean-up and waste management'.* The strategy identifies five key themes to support the delivery of this mission: *'Site Decommissioning and Remediation defines our approach to decommissioning redundant facilities and managing land quality in order that each site can be released for beneficial reuse.* *Spent Fuel Management defines our approach to managing the diverse range of spent nuclear fuels for which we are responsible.* *Nuclear Materials defines our approach to dealing with the inventory of uranium and plutonium currently stored on some of our sites.* *Integrated Waste Management considers how we manage all forms of waste arising from operating and decommissioning our sites, including waste retrieved from legacy facilities.* *Critical Enablers support the overall delivery of our mission and, in some cases, reflect the supplementary duties assigned to the NDA.'*
The Decommissioning of the UK Nuclear Industry's Facilities (2004)[36]	Statement of the UK Government and devolved administrations' policy on the decommissioning of nuclear facilities (the UK Decommissioning Policy). The UK Decommissioning Policy requires that operators produce and maintain decommissioning strategies and plans before they plan to close facilities, that decommissioning strategies and plans are maintained, periodically reviewed and updated at least every five years. Relevant details of the current decommissioning strategy and plan for HPB, are described in **Chapter 2: The Decommissioning Process** of this ES. The current decommissioning strategy and plan for HPB has been developed taking into account the factors set out in para. 5 of the UK Decommissioning Policy, including the following factors which are of most relevance to this ES: ▪ minimising waste generation and providing for effective and safe management of wastes which are created, ▪ minimising environmental impacts including reusing or recycling materials whenever possible, ▪ maintaining adequate site stewardship, ▪ maintaining access to an adequate and relevant skills and knowledge base, and ▪ using existing best practice wherever possible.

[35] NDA. 2021. Nuclear Decommissioning Authority Strategy 2021 . Available at: NDA Strategy 2021 (publishing.service.gov.uk) (Accessed August 2024))

[36] Department of Energy and Climate Change (2004). The Decommissioning of the UK Nuclear Industry's Facilities. (Online) Available at: The_Decommissioning_of_the_UK_Nuclear_Industrys_Facilities.pdf (publishing.service.gov.uk) (Accessed January 2024).

Policy	Summary
Draft overarching policy	
Part I **UK policy proposals for managing radioactive substances and nuclear decommissioning**[37]	Draft Policy document setting out the UK Government and the devolved administrations are proposing a UK-wide policy framework that draws together, in a single point of reference, policies on the management of radioactive substances and nuclear decommissioning. Part 1 sets out proposed changes to amend, update and clarify some of these policies with the aim of driving improvements in nuclear decommissioning and clean-up programmes and the management of radioactive materials, and the waste they generate. Consultation ran: 1 March 2023 to 24 May 2023
Part II **Draft UK policy framework for managing radioactive substances and nuclear decommissioning**[38]	Draft policy document setting out UK-wide policy framework for managing radioactive substances and nuclear decommissioning. It covers the management of radioactive substances under normal operating conditions, including orphan sources (radioactive sources which have been abandoned, lost, misplaced, stolen, or otherwise transferred without proper authorisation). Consultation ran: 1 March 2023 to 24 May 2023
National Policy	
National Planning Policy Framework (NPPF) (2023)[39]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it is considered to be a reference for achieving sustainable development and has been referred to for the assessment of the Proposed Works. The NPPF was published in March 2012 and has undergone a series of revisions, most recently in December 2023. The NPPF is supported by the Planning Practice Guidance (PPG). The PPG was first published in March 2014 . PPG is available as a web-based resource and is updated as and when required.
National Waste Management Plan	The WMPE provides an analysis of the current waste management situation in England and fulfils the mandatory requirements of Article 28 of the revised Waste Framework Directive.

[37] Department for Energy Security and Net Zero. 2023. Part I - UK policy proposals for managing radioactive substances and nuclear decommissioning. Available at: Part I UK policy proposals for managing radioactive substances and nuclear decommissioning (publishing.service.gov.uk). (Accessed August 2024)

[38] Department for Energy Security and Net Zero. 2023. Part II - Draft UK policy framework for managing radioactive substances and nuclear decommissioning. Part II UK policy proposals for managing radioactive substances and nuclear decommissioning (publishing.service.gov.uk). (Accessed August 2024)

[39] Ministry of Housing, Communities and Local Government. 2023. The National Planning Policy Framework (NPPF). (Online) Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf (Accessed August 2024).

Policy	Summary
for England (WMPE) (2021)[40]	The WMPE does not apply to radioactive waste.
National Planning Policy for Waste (NPPfW) (2014)[41]	The National Planning Policy for Waste (NPPfW) sets out detailed waste planning policies. It should be read in conjunction with the NPPF[39], and the WMPE (and National Policy Statements, where relevant). All Local Planning Authorities (LPAs) should have regard to its policies when discharging their responsibilities to the extent that they are appropriate to waste management. No specific reference is made to radioactive or high activity waste in the NPPfW; however, policies are provided to guide planning and decision making in relation to waste management facilities.

4.5 Local planning policy

Introduction

4.5.1. The ES considers local policy which is relevant to the Proposed Works as summarised in Table 4-5. Where these local policies are relevant to specific technical aspects, they will be discussed further in **Chapters 6 – 20** of this ES.

4.5.2. The Site is located within the administrative area of Somerset Council, a unitary authority, created in April 2023 and replaces Somerset County Council. The new unitary council brings together the services previously provided by the four district councils in Somerset (Mendip, Sedgemoor, Somerset West and Taunton, and South Somerset) alongside the services formerly provided by Somerset County Council. Where text in this ES refers to Somerset County Council, these discussions occurred prior to April 2023.

Table 4-5 - Local policy relevant to the Proposed Works

Policy	Relevance
Somerset Waste Core Strategy (2013)[42]	Waste planning policy is outlined in the Somerset Waste Core Strategy, which was adopted by SCC in February 2013. It is part of the development framework for Somerset and is used to determine waste planning applications which are submitted to SCC. The Waste Core Strategy guides the approach to planning for sustainable waste management in Somerset until 2028. It covers all forms of waste including household, commercial, industrial and construction waste. A series of topic papers provide the evidence base for the planning policy, these include:

[40] Defra (2021). The National Waste Management Plan for England (WMPE) 2021. (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/955897/waste-management-plan-for-england-2021.pdf (Accessed August 2024).
[41] Department for Communities and Local Government (2014). The National Planning Policy for Waste (NPPfW) 2014. (online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf (Accessed August 2024).
[42] Somerset County Council (2013). Somerset Waste Core Strategy (Online). Available at: https://www.somerset.gov.uk/waste-planning-and-land/somerset-waste-core-strategy/ (Accessed August 2024).

Policy	Relevance
	▪ Waste Topic Paper 1: Waste management need to 2028; ▪ Waste Topic Paper 2: Broad locations for strategic waste management facilities; ▪ Waste Topic Paper 3: Transport policy and infrastructure; ▪ Waste Topic Paper 4: Site waste management report; ▪ Waste Topic Paper 5: Commercial and industrial waste survey: summary; ▪ Waste Topic Paper 6: Radioactive waste; ▪ Waste Topic Paper 7: Waste management and low carbon development; and ▪ Waste Topic Paper 8: Strategic Flood Risk Assessment: non-technical summary.
Adopted West Somerset Local Plan to 2032 (2016)[43]	The West Somerset Local Plan was adopted in November 2016. The document includes a set of planning policies for the parts of the area outside Exmoor National Park (which includes areas where the HPB Site is located). It replaces most of the policies of the Saved West Somerset District Local Plan adopted in 2006. The 2016 West Somerset Local Plan to 2032 remains the adopted local plan for the area.
Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) (2020)[44]	This document was part of the first consultation stage (concluding in October 2020) for the development of the new Local Plan. It was anticipated that the new Local Plan would be adopted in December 2021, however, following the formation of Somerset Council unitary authority, this draft Local Plan is no longer being progressed. , and is not a material consideration in the aspect assessments presented in the ES. It is not expected that a new Development Plan will be prepared by Somerset Council prior to the submission of the ES.
Sedgemoor Local Plan 2011-2032 (2019)[45]	The 2011-2032 Local Plan replaces the Core Strategy 2006-2027 and sets out how the district aims to grow and develop into the future. It provides a policy framework, addressing specific requirements relating to housing, employment, retail and other facilities and infrastructure. Specifically, paragraph 5.7 identifies the decommissioning of HPB as a strategic project, noting its inclusion in Bridgwater Vision. This is in support of Policy B1 which states: 'Major development proposals should demonstrate how they support or facilitate the delivery of relevant projects set out in the Bridgwater Vision (2015). Proposals that would prejudice their future implementation will not be supported.'
South West Inshore and South West Offshore	This plan was prepared as a result of Section 51 of the Marine and Coastal Access Act 2009. It provides a "*strategic approach to planning within the English*

[43] West Somerset Council (2016). West Somerset Local Plan to 2032. (Online) Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Planning%20and%20Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSWT%20%2D%20West%20Somerset%20Local%20Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy&p=true&ga=1 (Accessed January 2024).

[44] Somerset West and Taunton Council (2020). Somerset West and Taunton Local Plan 2040 Issues and Options Document (online). Available at: https://www.somersetwestandtaunton.gov.uk/media/2167/issues-and-options.pdf (Accessed January 2024).

[45] Sedgemoor District Council. (2019). Local Plan 2011-2032 Sedgemoor Local Plan – Adoption Version. (Online) Available at: https://www.sedgemoor.gov.uk/LocalPlan (Accessed January 2024).

Policy	Relevance
Marine Plan June 2021 (2021)[46]	*inshore and offshore waters between the Severn Estuary border with Wales and the River Dart in Devon*". Its purpose being to "*enhance and protect the marine environment and achieve sustainable economic growth while respecting local communities both within and adjacent to the marine plan areas.*"
North Devon and Somerset Shoreline Management Plan (SMP2) (2010)[47]	The SMP is a large-scale assessment of the risks associated with coastal tides and aims to help inform the future management of these risks to land and people through its action plan.

4.5.3. A new single Local Development Scheme for Somerset to cover both a new Somerset Local Plan and Minerals and Waste Plan will be prepared by Somerset Council in due course. The Somerset Local Plan will be submitted for examination in early 2027, with the inspectors report due in early 2028 and adoption anticipated March 2028. At this time, as limited information is available, any forthcoming local plan has limited weight in the preparation of this ES.

4.6 Other regulatory requirements

4.6.1. Implementation of the Proposed Works, it is anticipated that the following licences and/or permits:

- **Planning permission** – New buildings, structures, and engineering works (for example those listed in **Table 4-3** that are required to enable the decommissioning of HPB may also require planning permission from Somerset Council under the Town and Country Planning Act 1990. EIADR consent is not required for the construction of the waste processing facilities but will be required in order to operate those facilities during the Preparations for Quiescence phase.
- **Marine Licence** – Activities including the sealing off and removal of power station marine infrastructure and the construction of new effluent discharge are likely to require a marine licence. Marine licences will be sought where required under The Marine and Coastal Access Act 2009 from the MMO.
- **Environmental Permitting** - The Environmental Permitting (England and Wales) Regulations 2016 (as amended) require environmental permits to be issued for the handling and/or storage of certain waste materials. The Environment Agency would be responsible for issuing permits.
- **Radioactive Substances (RSR) Permit** – When carrying out a radioactive substances activity, a RSR permit is required from the Environment Agency before the activity is scheduled to begin. If the permit is already in place, it may require variation to reflect changes in how the site is operated. Other non-nuclear environmental permits or exemptions may also be required if these are not already in place before the decommissioning works begin. The Guidance on Requirements for Release from Radioactive Substances for operators of nuclear sites that hold, or intend to hold, an environmental permit for the disposal of radioactive waste describes how submissions to the regulators are required to demonstrate how the site meets the requirements for it to be released from radioactive substances regulation.

[46] UK Government. (2021). South West Inshore and South West Offshore Marine Plan June 2021. (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004494/FINAL_South_West_Marine_Plan__1_.pdf (Accessed August 2024).
[47] North Devon and Somerset Coastal Advisory Group (2010) Shoreline Management Plan Review (SMP2) Hartland Point to Anchor Head (online). Available at: NDASCAG SMP2 - SWRCMP (coastalmonitoring.org) (Accessed August 2024).

- **Discharge Consent (for surface/groundwater)** - Under the provisions of the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[15], should any water be required to be discharged/abstracted as part of the Proposed Works, as separate licence will be required from the Environment Agency.
- **Hazardous Substances Consent** – The Planning (Hazardous Substances) Regulations 2015[48] implement land-use planning requirements on the control of major accident hazards. These regulations require hazardous substances consent for the presence of certain hazardous substances at or above controlled quantities. There will be a requirement to vary or surrender existing Hazardous Substances Consents due to reductions in chemical volumes stored onsite.
- **Control of Major Accident Hazards (COMAH) –** HPB has reduced its holdings of dangerous substances, meaning it is no longer subject to the Control of Major Accident Hazards Regulations 2015.

[48] UK Government (2015). The Planning (Hazardous Substances) Regulations 2015. Available at: The Planning (Hazardous Substances) Regulations 2015 (legislation.gov.uk) (accessed August 2024).

5

Approach to Environmental Impact Assessment

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5 Approach to Environmental Impact Assessment

5.1 Introduction

5.1.1. This chapter of the Environmental Statement (ES) describes the generic approach and methodology which has been followed for the Environmental Impact Assessment (EIA) for the Proposed Works. EIA is a process for identifying the potential impacts and likely environmental effects (positive and negative) of a project. It is a tool to inform decision-making with respect to the granting of consent by the relevant regulatory body. The EIA process culminates in the provision of an Environmental Statement (ES) which presents the findings of the EIA and describes the likely significant effects, including cumulative effects, associated with a project.

5.1.2. Schedule 1 of the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR)[1] (as amended) sets out the information which may need to be included in an ES. The relevant environmental aspects which should be considered for their potential significant effect are set out in Paragraph 4:

- "*A description of the factors specified in regulation 10B(3) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape*."

5.1.3. The EIA process should be systematic, analytical, impartial, consultative, and iterative allowing opportunities for environmental concerns to be addressed. Typically, a number of iterations take place in response to environmental constraints and opportunities identified during the EIA process, stakeholder engagement and consultation prior to submission (see **Section 5.5**). This iterative process is a fundamental element of the EIA to avoid reduce or mitigate potential significant adverse effects, as far as reasonably practicable.

5.1.4. The environmental aspect assessments (**Chapters 6-20**) have been carried out using the general approach and processes set out in this chapter. Where required, specific aspect chapters may differ from the approach set out in this chapter in order to properly address particular requirements, such as those outlined in relevant best practice and guidance specific to that topic. Any changes to the approach set out here are detailed in the appropriate environmental aspect chapter. These approaches are based on recognised good practice and guidelines (for example ONR's guidance on EIADR[2]) relevant to both EIA as a whole or that specific environmental aspect chapter.

[1] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (Online). Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).
[2] ONR (2023). Guidance on the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations. (Online). Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.onr.org.uk%2Foperational%2Fother%2Fonr-nlr-gd-001.docx&wdOrigin=BROWSELINK (Accessed August 2024).

5.2 EIA terminology

Impacts and effects

5.2.1. The terms 'impact' and 'effect' are often used synonymously, and this can lead to confusion. For clarity, a cause-and-effect logic will be applied to the EIA of the Proposed Works, whereby impacts are the changes that arise as a result of decommissioning (e.g. changes in water quality) and effects are the consequences of those changes (e.g. marine habitat becomes degraded by the change in water quality).

Types of effects

5.2.2. Schedule 1, paragraph 5 of the EIADR[1] states that the ES should include:

5.2.3. "*The description of the likely significant effects on the factors specified in regulation 10B(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project.*"

5.2.4. The ES considers all of these types of effects, as appropriate, in the environmental aspect chapters (**Chapters 6-20**), in so far, that individual aspects are so affected. However, whilst some terms are self-explanatory, a list of definitions of the key types of effects have been provided to confirm how these terms have been applied throughout the ES.

Direct effects

5.2.5. Direct effects are those that result directly from the Proposed Works, such as the potential direct impacts on water quality within the surrounding marine environment from removal of parts of the cooling water intake.

Indirect and secondary effects

5.2.6. Indirect and secondary effects are those that result from consequential change caused by the Proposed Works. As such they would normally occur later in time or at locations farther away than direct effects. An example would be the effect on marine ecology from changes in water quality which has been altered from removal/decommissioning of parts of the cooling water intake.

Transboundary effects

5.2.7. Transboundary effects are those effects that would affect the environment in another state within the European Economic Area (EEA).

Cumulative effects

5.2.8. Two types of Cumulative Effects Assessments (CEA) have been considered in the assessment:

- Inter-project (combined with other development) cumulative effects; effects resulting from the Proposed Works combining with the same topic-related effects generated by other developments to affect a common receptor; and
- Intra-project (within the Proposed Works) cumulative effects; individual environmental aspect effects resulting from the Proposed Works, which are not significant in their own right, but could combine with other environmental aspect effects from the same development to create effects that are significant.

5.3 The EIA process

5.3.1. As outlined in **Chapter 4: Policy and Legislation Overview**, the Project falls under the EIADR[1]. The EIADR set out the procedures to be followed in relation to EIAs undertaken for nuclear decommissioning in the UK.

5.3.2. The ONR provide guidance via the Guidance on the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations[2], to nuclear licensees to establish the requirements to achieve compliance with EIADR, and ultimately gain consent to dismantle and decommission a nuclear facility.

5.3.3. The EIA undertaken for the Proposed Works has focused on aspects and matters where a likely significant effect may occur. This approach ensures that the EIA process is proportionate in line with best practice and focuses effort in those areas where significant effects are likely as required by Regulation 5(1) of the EIADR[1].

5.3.4. The preparation of this ES is one of the key stages in the EIA process as it has brought together information about any likely significant environmental effects.

5.4 EIA Scoping

5.4.1. A Scoping Report was submitted by the Applicant to the ONR on 05 October 2022. The Scoping Report presented the Indicative Decommissioning Works Area boundary (IDWA) which defined the area within which the decommissioning, deconstruction, and dismantling activities would be located. This set out the likely significant environmental effects (as identified at that time) that would be assessed in more detail in the ES (i.e. scoped-in) as well as those that were unlikely to be significant and could therefore be scoped-out of further assessment.

5.4.2. A Pre-application Opinion was adopted by the ONR on 7 December 2022 and is appended in **Appendix 5A**. The Pre-application Opinion and the statutory consultee responses have subsequently informed the assessment work and further design evolution undertaken to date. A summary of the Pre-application Opinion comments and where they are addressed in this ES is provided in **Table 5-1** of this chapter, **Chapter 4: Policy and Legislation Overview** and environmental aspect chapters (**Chapters 6-20**).

5.4.3. Within the Pre-application Opinion, the ONR cited a specific point relating to additional topics that, in the opinion of the ONR were not addressed sufficiently within the Scoping Report and that were therefore to be considered in the EIA. These topics are:

- Transboundary effects;
- human health impacts;
- impacts on fishing, maritime recreation and maritime commercial services;
- material and resources use; and
- marine archaeology and shipwrecks.

5.4.4. The Applicant consulted with the ONR in December 2022 on this matter and agreement was sought for the Applicant to submit a Technical Note, to provide clarity on the scoping in or out of these topics. The Technical Note is presented in **Appendix 5B**.

Table 5-1 – Summary of Pre-application Opinion Responses

Paragraph Ref.	Consideration	How addressed in the ES
13	In section 4.6 of the scoping report, a preliminary assessment for both intra-project and inter-project cumulative effects has not been provided to demonstrate if potential significant effects could occur and thus whether this is scoped in or out of the EIA. The ES should include an assessment of cumulative effects and provide clear rationale on how the Study Area was defined for the assessment. In addition, the choice of projects/developments included in the assessment of cumulative effects should be clearly justified. Specific examples relevant to this reservation have been included in Appendix 2 of the PAO.	This chapter of the ES clearly sets out the scope of the intra-project and inter-project assessments, as identified in the Scoping Report and agreed with relevant stakeholders. **Chapter 21: Cumulative Effects Assessment (CEA)** presents the assessment and associated conclusions.
14	In section 4.7 of the scoping report (Transboundary Effects), there is insufficient information and evidence to conclude whether a European Economic Area State could be significantly affected. The information provided is focused on radiation doses to members of the public but does not consider other potential significant effects on the environment, or other social aspects. The likely significant transboundary effects should be considered further in the EIA process and reported in the ES.	Noted, transboundary effects are scoped out of the EIA and a statement confirming this has been provided in **Section 5.10** of this chapter. This has been agreed with the ONR in advance of this ES via submission of a technical note clarifying our position in respect to transboundary effects, in the context of the relevant Zones of Influence for each of the technical aspect assessments (see **Appendix 5B**).
25	Within the topic chapters, there is inconsistency when determining the significance of effects. An overarching significance matrix is provided in Table 4.3 of the scoping report, however in some of the topic chapters there is no reference to this matrix or methodology for how significant effects will be determined. Whilst it is appropriate for the matrix to be adapted for each topic area, there should be consistency in the information provided.	This chapter specifically paragraphs 5.7.11 – 5.7.15 discuss the approach to determining significance and the application of a significance matrix. Specifically, this section highlights that there are variations to the generic approach presented in Chapter 5 which are presented in the respective technical aspect chapters (e.g. variance of matrix, omission of a matrix, omission of criteria). The environmental aspect chapter **(6 – 20)** of this ES discuss any variations to generic

Paragraph Ref.	Consideration	How addressed in the ES
		approach outlined in this chapter are explicitly signposted.
28	ONR recognises that due to the long durations of the decommissioning project, the amount of detail known for the later stages of the project will be limited. Whilst this uncertainty is acceptable, the scoping report does not indicate how the future phases (e.g. Final site Clearance) will be assessed and reported in the ES. Paragraph 4.3.10 of the scoping report defines what a future baseline is, however, it is not clear what method has been used to determine the future baseline for the scoping exercise and for the EIA. The ES should provide further detail on how the future baseline has been determined, recognising any uncertainties and assumptions that have been made.	Noted, this chapter (paragraphs 5.6.8 - 5.6.10) provides a statement to confirm the approach taken to the consideration of the future baseline in this ES. The 'without scheme' scenario is not required as decommissioning is a statutory requirement and must go ahead. The future baselines of the environmental aspect specific chapters therefore reflect this scenario. Care will be taken in the ES to ensure that this is clearly and explicitly explained in each specific technical environmental aspect chapter.
29	Further to this, ONR notes the scoping report recognises that interim consideration of the evolving baseline will be required due to the extended duration of the decommissioning project and states that "*interim reviews will be built into the decommissioning programme and refinements to assessments implemented as necessary*." It would be useful for the ES to provide an outline approach to how interim reviews will be undertaken in order to manage uncertainties and limitations as the project progresses.	For further context on the consideration and management of EIADR compliance, **Appendix 5C** presents a document which outlines the arrangements NRS may take to review ongoing programme and works, and their alignment to EIADR. The Outline Environmental Management Plan (EMP) presents the outline monitoring arrangements and will be reviewed and updated as necessary in response to delivery of the Proposed Works.
30	There is a general lack of information on how the future baseline has been defined for the purpose of the scoping exercise and for the EIA across all topic areas. A consistent approach to defining and describing the future baseline should be applied to the ES.	See response to Ref 28.
32	As expected at the scoping stage, there is a level of uncertainty and limitations to the assessment. The scoping exercise is based on initial baseline data and	Noted, as per **Section 5.11** of this chapter, where relevant, assumptions are detailed in each

Paragraph Ref.	Consideration	How addressed in the ES
	limited project information. Uncertainties and limitations encountered during the scoping exercise have not been clearly documented, nor has an approach to be used to address or manage these in the EIA been set out. Clarity on the management of uncertainties and limitations should be provided in the ES.	of the environmental aspect assessments to enable the definition of a worst-case scenario. The sections clearly identify any assumptions that influence the assessment and report these in a sub-section of the methodology section in each environmental aspect chapter.
33	In general, there is uncertainty across the scoping report on what activities are considered in the scope of the EIADR project and thus to be included in the EIA. While a description of the decommissioning process is provided in section 2 of the scoping report, there is uncertainty on when the current operational phase (defueling) ends, and the Preparations for Quiescence phase commences (section 2.3). As decommissioning plans are developed and more information becomes available, further detail should be provided in the ES to provide clarity. Further examples of where the definition of the scope of the decommissioning project could be refined in the ES are included in **Appendix 2**.	**Chapter 2: The Decommissioning Process** of this ES builds on the detail presented at the Scoping Stage. **Appendix 5C** discusses how EIADR compliance will be managed over the duration of the Proposed Works.
40	A number of consultation comments noted the age of surveys and data used in the scoping report and the need for up-to-date information to be used in the EIA process. For example, the surveys for the presence of Great Crested Newts and Water Voles are three years out of date and therefore the conclusions of the scoping exercise may not be substantiated by up-to-date evidence. In addition to this, the latest climate change projections published on gov.uk should be used when considering future climate change impacts	Where surveys have been undertaken in support of environmental aspect assessments, these are reported in the relevant chapter (**Chapter 6-20**). **Chapter 7: Climate Change** references UKCP18. **Chapter 8: Terrestrial Biodiversity and Ornithology,** includes a baseline verification report (**Appendix 8J**)**.**
60	The ES should set out what consultation has been done, who has been consulted, how it was undertaken, and what the outcome was.	The Consultation Feedback Report submitted as part of this EIADR application, presents information pertaining to the consultation process. Specific responses to the Pre-Application Opinion and any

Paragraph Ref.	Consideration	How addressed in the ES
		additional technical engagement with consultees are presented where relevant in the environmental aspect chapters of the ES under the 'Consultation and Technical Engagement' subsection.
Appendix 2, Table row 1	It is not clear how the cumulative impacts of other projects and developments, for example HPA and HPC, have been considered in the scoping report, and how the assessment of the cumulative effects will be undertaken in the EIA. The cumulative impact assessment in the ES should provide clear rationale on how the Study Area was defined and the choice of projects/developments included in the assessment should be clearly justified.	See response to Ref 13.
Appendix 2, Table row 1	The Scoping Report clarifies that the ZoI will be defined by each environmental topic and be combined into a single area. This approach is deemed suitable, however the rationale for this ZoI has not been provided, for example the ZoI could be considered as being the greatest ZoI of a topic.	Further detail on the rationale for the Zone of Influence (ZoI) is provided in **Chapter 21: Cumulative Effects Assessment** of this ES.
Appendix 2, Table row 1	Within **Appendix 4A** (Cumulative Effects Assessment – Other Development), a number of developments including HPA and the Bridgwater Tidal Barrier Scheme have not been included. These could be omissions and should be reviewed for the EIA. If not included, a justification should be provided. The method for determining the initial list has not been included, nor has a description of how cumulative effects could occur.	A long list of development is considered within the ZoI and is provided in **Appendix 21B**. This list was issued to and agreed with Somerset Council in spring 2024. HPA and the Bridgwater Tidal Barrier Scheme have been included as requested.
Appendix 2, Table row 1	It is noted that the list of developments provided in **Appendix 4A** is preliminary and should be updated to reflect strategic development set out in the Sedgemoor and Somerset West and Taunton Local Plans, given the timescales for decommissioning. In addition to this, the Gravity Local Development Order should also be considered.	A long list of development is considered within the ZoI and is provided in **Appendix 21B**. This list was issued to and agreed with Somerset Council in spring 2024. This includes strategic development set out in the relevant local plans within the ZoI. The Gravity Local Development Order has also been included, however, at the time of writing, the only agreed unit is Agratas, and there is

Paragraph Ref.	Consideration	How addressed in the ES
		limited information available in the public domain at this time for other units and when they will be brought forward.
Appendix 2, Table row 1	What is covered in the future baseline and what is covered in the cumulative impact assessment should be considered and double counting should be avoided. The methodology also does not provide assessment years and how future phases will be assessed.	The environmental aspect assessments have defined the future baseline within their respective chapters (Chapter 6-20 of this ES). Where a specific assessment year has been considered, this has been set out in the relevant chapter e.g. **Chapter 15: Noise and Vibration**, where future baseline years of 2030 and 2034 have been considered. The cumulative effects assessment, which considers the potential for other developments to interact with is presented in **Chapter 21: Cumulative Effects Assessment**. The general approach with regards to HPC and HPA is as follows: ▪ the ongoing HPC construction works (consented) form part of the future baseline as these works are ongoing. ▪ However, the material amendment application for HPC forms part of the cumulative effects assessment. ▪ HPA decommissioning is slightly different due to the long duration of these activities where there is the potential for overlap, this is signposted to the relevant assessment section to avoid duplication.

Paragraph Ref.	Consideration	How addressed in the ES
Appendix 2, Table row 4	Within the topic chapters, there is inconsistency when determining the significance of effects. An overarching significance matrix is provided in Table 4.3 of the scoping report, however in some of the topic chapters there is no reference to this matrix or methodology for how significant effects will be determined. Whilst it is appropriate for the matrix to be adapted for each topic area, there should be consistency in the information provided.	See response to Ref 25.
Appendix 2, Table row 6	Within the future baseline section of topic chapters, HPA and HPC have been included in some instances and have not in others; a consistent approach has not been followed. In **Appendix 4A**, HPC has been included as a project for consideration in the cumulative impact assessment. It will be important not to double-count the assessment in the EIA, with clear boundaries established between cumulative and future baseline.	The general approach followed is that the ongoing HPC construction works (consented) form part of the future baseline as these works are ongoing. However, the material amendment application for HPC forms part of the cumulative effects assessment. HPA decommissioning is slightly different due to the long duration of these activities. Where there is the potential for overlap, this is signposted to the relevant assessment section to avoid duplication.
Appendix 2, Table row 6	There is limited information on who is responsible for the decommissioning of the 400kv substation and when this will be undertaken and if this is to be considered as future baseline or within the cumulative impact assessment.	The 400kv substation is not to be decommissioned under the scope of the EIADR assessment and has been removed from the Works Area. This is on the basis that this forms part of the transmission licensed infrastructure as opposed to generation licenced equipment and is not solely/explicitly associated with operation of HPB.
Appendix 2, Table row 7	Paragraphs 4.3.1 to 4.3.4 are well written and set out good practice and industry standard for the EIA scoping exercise. It would have been useful in this section to acknowledge that the information available at a scoping stage is limited and to manage this limitation and uncertainty, assumptions are made using for example a realistic worst case. Through the EIA process, as	See response to Ref 32.

Paragraph Ref.	Consideration	How addressed in the ES
	information becomes available the scope may be further refined.	
Appendix 2, Table row 7	There may be uncertainty over activities in the later stages of decommissioning, therefore it may not be possible to be definitive. The ES should therefore cover the strategic intention for eventual completion of decommissioning. Details should be given on the range of options being considered for future activities. Where there is uncertainty in the later stages, this should be indicated in the ES, with details on how the EIA approached the uncertainty.	Noted. **Chapter 2: The Decommissioning Process** of this ES considers at a high level, the potential End State conditions and the requirements to achieve them.
Appendix 2, Table row 7	There will be a number of uncertainties and limitations around the development and assessment of the future baseline as well as the assessment of future phases. The ES should document all limitations encountered and how they were managed. For example, it may be that further future baseline data is collected through the lifetime of the project, or reviewed against climate data as it is updated, and further assessment undertaken at specific points in the programme. The Scoping Report sets out the possibility of interim reviews, however an approach on how this will be undertaken and reported in the ES has not been included.	See response to Ref 28.

5.5 Consultation and engagement

5.5.1. The Applicant has undertaken consultation to gain feedback on the methodology for the decommissioning works, refine the scope of the EIADR assessment and assist in the development of any required mitigation.

5.5.2. There have been two rounds of non-statutory consultation.

Non-statutory consultation

5.5.3. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024. Advertisements were placed in local newspapers and a social media campaign on Facebook, LinkedIn and Google were undertaken to raise awareness of the consultations. Letters providing information on the consultation were also sent directly via email to stakeholders identified as having an interest in the proposals. For Round 1 Consultation, a press release was issued to local newspapers notifying communities of the upcoming consultation, which received coverage.

5.5.4. Public exhibition events were held at accessible venues within communities who may be interested in the proposals. At the Round 1 Consultation, 35 people attended the three events, and 11 attended the two events held for Round 2. A virtual exhibition space was also made available at both

rounds to provide an alternative for those unable to attend the public events, which accumulated 191 total views in the first round, and 239 in the second.

5.5.5. A range of materials were provided at both rounds; online on the Applicants website, at the public events, and deposited at local libraries, in order to ensure accessibility of information to a range of audiences. These included a Consultation Document providing non-technical information on the Proposed Works, phasing, waste management, and preliminary environmental assessments. A Frequently Asked Questions document provided for each round outlined likely queries regarding the Proposed Works and consultation and provided answers to these. At Round 1 Consultation, the EIA Scoping Report was also provided for consultees to view and comment on as the consultation was undertaken in parallel to ONR's consideration of the document prior to the production of their Pre-application Opinion (**Appendix 5A**).

5.5.6. Feedback could be submitted through an online feedback form, in hard copy to the project Freepost address, and by email. 19 responses were received to the first round of consultation, and 5 to the second. After each round, the project team reviewed feedback received for consideration within the design development of the Proposed Works. Information on the consultation undertaken by the Applicant, including details of how regard was given to feedback received and the Applicant's response to issues raised, is provided in the Consultation Feedback Report.

Consideration of engagement in the EIA process

5.5.7. The approach to the EIA has been informed by the EIA scoping process, public consultation and standalone technical stakeholder engagement.

5.5.8. Alongside the non-statutory Round 1 Consultation, the Applicant undertook a series of presentations sharing information on the Proposed Works and consultation at meetings of Community Councils near to Hinkley B were offered. Only Stogursey Parish Council took up the offer of a presentation. A summary of feedback to the Round 1 Consultation to date was provided at the HPB Site Stakeholder Group (SSG) meeting on 28 October 2022 which provided time to respond to queries on the Proposed Works.

5.5.9. At the start of the Round 2 Consultation, the Applicant offered to present at the HPB SSG meeting; however, it was agreed with Chair of the SSG that this is not required due to limited response from the SSG members. The Applicant also held meetings with Somerset Council (12 April 2024) and the Envrionment Agency (04 April 2024) prior to the commencement of the Round 2 Consultation.

5.5.10. Each environmental aspect chapter (**Chapters 6-20**) includes a 'Consultation and Stakeholder engagement' section which provides a record of all relevant comments received from environmental bodies, in relation to that aspect with information as to how the Pre-application Opinion and consultation responses have been addressed in the ES. The section in environmental aspect chapter also details any technical engagement with relevant environmental bodies undertaken during the EIA process.

5.6 Determining the scope of the assessment

Technical scope

5.6.1. This ES accords with the requirements of the EIADR in relation to the content of this ES. **Table 5-2** signposts where the information is provided in the ES pursuant to Regulation 5 and Schedule 1 of the EIADR[3].

Table 5-2 – Information required in the ES

Topics Required in EIA Regulations	Where considered on the ES
Regulation 5 and Schedule 1 Part 1 EIADR	
Description of project, including in particular: ▪ *(a) description of the location of the project.* ▪ *(b) a description of the physical characteristics of the whole project, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases;* ▪ *(c) a description of the main characteristics of the operational phase of the project (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used; and* ▪ *(d) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases.* (Schedule 1 Para 1 EIADR)	**Chapter 2: The Decommissioning Process** Environmental aspect **Chapters 6 – 20**.
A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the licensee, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects. (Schedule 1 Para 2 EIADR)	**Chapter 3: Alternatives**
A description of the relevant aspects of the current state of the environment (baseline scenario) and an	Environmental aspect **Chapters 6 – 20**.

[3] UK Government (2018). *The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018*. (Online). Available at: https://www.legislation.gov.uk/uksi/2018/834/made. (Accessed August 2024).

Topics Required in EIA Regulations	Where considered on the ES
outline of the likely evolution thereof without implementation of the project 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. (Schedule 1 Para 3 EIADR)	
A description of the factors specified in regulation 10B(3) likely to be significantly affected by the project: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape. (Schedule 1 Para 4 EIADR)	Environmental aspect **Chapters 6 – 20**.
A description of the likely significant effects of the project on the environment resulting from, among other things: ▪ *(a) the construction and existence of the project, including, where relevant, demolition works;* ▪ *(b) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;* ▪ *(c) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;* ▪ *(d) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters);* ▪ *(e) the cumulation of effects with other existing or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources; and* ▪ *(f) the impact of the project on climate (for example the nature and magnitude of*	Environmental aspect **Chapters 6 – 20**, and the Cumulative Effects Assessment presented in **Chapter 21: Cumulative Effects Assessment**.

Topics Required in EIA Regulations	Where considered on the ES
greenhouse gas emissions) and the vulnerability of the project to climate change. ▪ *(g) the technologies and the substances used.* ▪ *The description of the likely significant effects on the factors specified in regulation 10B(3) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the project. This description should take into account the environmental protection objectives established at European Union or Member State level which are relevant to the project.* (Schedule 1 Para 5 EIADR)	
A description of the forecasting methods or evidence, used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved. (Schedule 1 Para 6 EIADR)	Environmental aspect **Chapters 6 – 20**.
A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements (for example the preparation of a post-project analysis). That description should explain the extent, to which significant adverse effects on the environment are avoided, prevented, reduced or offset, and should cover both the construction and operational phases. (Schedule 1 Para 7 EIADR)	Environmental aspect **Chapters 6 – 20**. **Outline EMP**.
A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to European Union legislation such as the COMAH Directive or the Nuclear Safety Directive or other relevant environmental assessments may be used	**Chapter 18: Major Accidents and Disasters**

Topics Required in EIA Regulations	Where considered on the ES
for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on the environment and details of the preparedness for and proposed response to such emergencies. (Schedule 1 Para 8 EIADR)	
A non-technical summary of the information provided under paragraphs 1 to 8. (Schedule 1 Para 9 EIADR)	**Non-Technical Summary**.
A reference list detailing the sources used for the descriptions and assessments included in the report. (Schedule 1 Para 10 EIADR)	Environmental aspect **Chapters 6 – 20**.

Identification of baseline conditions

5.6.2. Determining the existing environmental conditions is an important part of the EIA process. Baseline data are collected to better understand the potential effects from the Proposed Works and may quantify existing levels of pollutants (e.g. for noise, air and water pollution) and identify potentially vulnerable/sensitive habitats, species or human populations/groups and other environmentally sensitive receptors such as historic environment receptors. Where a baseline aspect cannot be quantified then nominal levels of importance, quality or value are assigned based on widely accepted criteria.

5.6.3. The baseline has been established through desk-based studies and/or surveys of the Study Area for each environmental aspect/receptor and provides a 'baseline' against which changes, potentially caused by the Proposed Works, can be compared. The baseline environment encompasses the Study Area, which are set out in each of the environmental aspect chapters (**Chapters 6-20**).

5.6.4. Detailed methodologies for baseline data gathering specific to each environmental aspect assessment can be found in **Chapters 6-20**.

Spatial scope

5.6.5. The spatial scope, referred to as the Study Area, of the assessment for each environmental aspect, i.e. the area over which changes to the environment are predicted to occur as a consequence of the Proposed Works, will depend on the nature of the potential effects and the location of receptors that could be affected. It takes account of:

- the physical area of the Proposed Works (i.e. the Works Area, as shown on **Figure 1.1**);
- the nature of the baseline environment; and

- the manner and extent to which environmental effects may occur.

5.6.6. Each environmental aspect chapter (**Chapters 6-20**) describes the Study Area to be considered, providing a clear explanation as to why that Study Area has been adopted. The spatial scope of each assessment has taken account of comments received from stakeholders, the EIA Pre-application Opinion and non-statutory consultation responses.

Temporal scope

5.6.7. The temporal scope covers the time period over which changes to the environment and the resultant effects are predicted to occur as a result of the Proposed Works, and are typically defined as either being temporary or permanent:

- Permanent - these are effects that will remain even when the Proposed Works are complete, although these effects may be caused by environmental changes that are permanent or temporary.
- Temporary – these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes.

5.6.8. Environmental effects have been compared to the situation prevailing before the Proposed Works commence (the current baseline), and to the situation that would prevail in the future without the Proposed Works (the projected future baseline). Where appropriate the evolving baseline has been considered within the environmental aspect assessments, noting the extended duration of the three decommissioning phases.

5.6.9. The future baseline is identified by extrapolating the current baseline using technical knowledge to predict likely changes (e.g., predictable changes such as climate change, changes that can be predicted based on reasonable assumptions and modelling calculations, information about other relevant developments etc.). It is recognised that interim consideration of the evolving baseline will be required due to the extended duration of the Proposed Works; interim reviews will be built into the decommissioning programme and refinements made to assessments undertaken as necessary.

5.6.10. Each environmental aspect chapter of this ES has defined the baseline (both current and future against which the environmental effects of the Proposed Works have been assessed). The baseline conditions which have been assessed for each environmental aspect are outlined in **Chapters 6-20** of this ES. Where relevant, environmental aspect chapters have provided further information on the indicative programme for specific elements of the Proposed Works that have been considered for assessment purposes.

5.7 Assessment of effects and determining significance

Overview of significant evaluation methodology

5.7.1. For consistency, and to allow comparison between aspects, the methodology described in this section has been applied when preparing the ES. This methodology is designed to consider whether impacts of the Proposed Works will have an effect on any environmental receptors. Assessments consider the magnitude of change and the sensitivity of aspect specific resources or receptors that could be affected to classify the level of the resulting effect.

5.7.2. The conclusion that is made on whether an effect is considered to be significant (or not significant) is either quantitatively defined against a relevant significance threshold, as per relevant technical guidance or based upon professional judgement. The technical aspect assessments conclusions

refer to the description of the Proposed Works in **Chapter 2: The Decommissioning Process**, and available information relating to:

- The magnitude and other characteristics of the potential changes (impacts) that are expected to be caused by the Proposed Works.
- The sensitivity of receptors to these changes.
- The effects of these changes on relevant receptors.
- The value or importance of receptors (where relevant).

5.7.3. For each environmental aspect, the categories of resource or receptor sensitivity and magnitude of change will be described or defined. The following sections therefore provide the generic criteria that will be applied for the definition of resource or receptor sensitivity, magnitude of change and classification of effect.

5.7.4. The environmental aspect chapters (**Chapters 6-20**) provide greater detail on the approach to the assessment and specific guidelines for the definition of impact magnitude and resource or receptor sensitivity for that environmental aspect. The approach to the assessment undertaken by each environmental aspect has broadly followed the approach set out in the following sections. Variations from this approach may be applicable to specific environmental aspects whereby professional judgment in the application of standards or guidance published by professional bodies (for example the Chartered Institute of Ecology and Environmental Management (CIEEM) or the Landscape Institute) is applied. Where this is the case, further detail and justification has been provided.

Evaluation matrices

5.7.5. Significance evaluation involves combining information about the sensitivity or value of a receptor, and the magnitude and other characteristics of the changes that affect the receptor. The approach to using this information for significance evaluation is outlined below.

Resource and receptor sensitivity

5.7.6. The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy, and as qualified by professional judgement. For example, receptors for landscape, biodiversity or the historic environment may be defined as being of international or national importance; lower value resources may be designated as being sensitive or important at a county or district level.

5.7.7. The use of a receptor would also play a part in its classification. For example, when considering effects on the amenity of a human population, a receptor used for recreational purposes may be valued more than a place of work as the environmental quality of the recreational receptor is more likely to be an important part of that receptor's use.

5.7.8. **Table 5-3** sets out the generic guidelines for the assessment of sensitivity of a resource or receptor.

Table 5-3 – Generic guidelines for the assessment of sensitivity

Value or Sensitivity	Guidelines
Very High	Value: Feature or receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site or receptor (for example designated features of international or national importance). Sensitivity: Feature or receptor has little to no capacity to accommodate the proposed form of change.
High	Value: Feature or receptor possesses key characteristics which contribute significantly to the distinctiveness, rarity and character of the site or receptor (for example designated features of international or national importance). Sensitivity: Feature or receptor has a very low capacity to accommodate the proposed form of change.
Medium	Value: Feature or receptor possesses key characteristics which contribute significantly to the distinctiveness and character of the site or feature (for example designated features of regional or county importance). Sensitivity: Feature or receptor has a low capacity to accommodate the proposed form of change.
Low	Value: Feature or receptor only possesses characteristics which are locally significant. Feature or receptor not designated or designated only at a local or district level. Sensitivity: Feature or receptor has some tolerance to accommodate the proposed change.
Very low	Value: Feature or receptor characteristics do not make a significant contribution to local distinctiveness and not designated. Sensitivity: Feature or receptor is generally tolerant and can accommodate the proposed change.

Magnitude of change

5.7.9. The magnitude of change affecting a receptor that would result from the Proposed Works is identified on a scale from minor alterations or change, up to major changes or the total or substantial loss of the receptor. For certain environmental aspects, the magnitude of change would be related to guidance on levels of acceptability (e.g. for air quality or noise), and be based on numerical parameters, whilst for others it will be a matter of professional judgement to determine the magnitude of change, using descriptive terminology.

5.7.10. **Table 5-4** sets out the generic guidelines of the assessment of the magnitude of change.

Table 5-4 - Generic guidelines for the assessment of magnitude

Magnitude	Guidelines
Very High	Very large-scale changes over the whole development area, and potentially beyond, to key characteristics or features of the particular environmental aspect's character or distinctiveness.
High	Large-scale changes over the whole development area and potentially beyond to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Medium	Medium-scale changes over the majority of the development area and potentially beyond to key characteristics or features of the particular environmental aspect's character or distinctiveness.
Low	Noticeable but small-scale changes over part of the development area and potentially beyond to key characteristics or features of the particular environmental aspect's character or distinctiveness.

Determination of significance

5.7.11. The determination of significance is derived with reference to information about the nature of the Proposed Works, the receptors that could be significantly affected and their sensitivity or value, together with the magnitudes of change that are likely to occur.

5.7.12. For many environmental aspects, significance is determined by using a matrix. Variations to this matrix approach are detailed within the respective aspect chapters (**Chapters 6-20**), along with descriptions of receptor sensitivity, magnitude of change and levels of effect that are considered significant. Definitions of how the categories used in the matrix are derived for each environmental aspect are also set out.

5.7.13. In addition, professional judgement may be applied in the assessment, as the boundaries between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may have needed clarifying.

5.7.14. The overarching significance matrix used for the EIA is shown in **Table 5-5**. The generic definitions used to determine the level of significance are shown in **Table 5-6**. Reference is made to:

- 'Major' effects, which will always be determined as being significant.
- 'Moderate' effects can be significant, or not significant, based on specific scenarios and professional judgement.

- ‘Minor’ or ‘negligible’ effects, which will always be deemed as ‘not significant’.

5.7.15. Effects can be either beneficial or adverse.

Table 5-5 - Example significance evaluation matrix

		Magnitude of change				
		Very high	**High**	**Medium**	**Low**	**Very low**
Sensitivity/importance/value	**Very high**	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

Table 5-6 - Generic classification of effect definitions

Significance rating	Guidelines
Major	Very large or large change in environmental or socio-economic conditions. Effects, both negative and positive, which are likely to be important considerations at a national to regional level because they contribute to achieving national or regional objectives, or which are likely to result in exceedance of statutory objectives or breaches of legislation.
Moderate	Intermediate change in environmental or socio-economic conditions. Effects that are likely to be important considerations at a regional or local level.
Minor	Small change in environmental or socio-economic conditions.
Negligible	No discernible change in environmental or socio-economic conditions. An effect that is likely to have a neutral or negligible influence.

5.8 Environmental measures

5.8.1. In accordance with Schedule 1(7) of the EIADR[1], the ES must include "*A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any significant adverse effects on the environment.*" For each environmental aspect, the EIA process has identified impacts and effects and takes into consideration environmental measures that the Proposed Works will adopt. These environmental measures include avoidance, best practice and design commitments, which are classified into primary or tertiary measures in accordance with the IEMA '*Guide to Shaping Quality Development*'[4] definitions as follows:

5.8.2. Primary (inherent): Referred to as 'embedded environmental measures', are modifications to the location, design or operation of components of the Proposed Works made during the pre-application phase that are an inherent part of the Proposed Works, and do not require additional action to be taken.

5.8.3. Secondary (foreseeable): Mitigating actions that will require further activity to achieve the anticipated outcome and are referred to as 'additional measures'.

5.8.4. Tertiary (inexorable): Actions that would occur with or without input from the EIA. These include actions that will be undertaken to meet other existing legislative requirements or actions that are considered to be standard practice used to manage commonly occurring environmental effects. These are referred to as 'good practice measures' and are also embedded within the Proposed Works. Such measures are typically secured via the implementation of an EMP. Opportunities for embedded environmental measures have been identified throughout the evolution of the Proposed Works and the EIA process, whereby likely significant adverse environmental effects have been fed back into the design process to verify whether they can be avoided or otherwise mitigated in accordance with the hierarchy. Alongside this, good practice measures have been identified with reference to legislative requirements and measures of standard practice to manage commonly occurring effects to also be considered in the assessment.

5.8.5. Following the application of embedded environmental measures, where the potential for a significant environmental effect remains, 'additional measures' will be considered to avoid, reduce, or compensate such an effect. The ES reports on the anticipated effects of the Proposed Works following the implementation of all environmental measures to determine the 'residual effects'. A clear statement has been made as to whether the residual effects are significant or not significant. Residual effects may be beneficial as well as adverse.

5.8.6. An Outline EMP is provided as part of this EIADR application to provide an indication of the future structure of the EMP, which will be implemented post-EIADR consent.

Monitoring measures

5.8.7. As required by the EIADR[1], there is a need to monitor the effectiveness and implementation of any proposed environmental measures, where appropriate. The means for securing how environmental measures will be implemented and monitored have been set out in this ES. Any monitoring

[4] IEMA. (2015). IEMA Environmental Impact Assessment Guide to Shaping Quality Development. Available at: https://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf (Accessed August 2024).

proposed with respect to significant adverse effects is identified in the environmental aspect chapters (**Chapters 6-20**).

5.8.8. A schedule of all the required embedded and good practice measures are recorded in the Outline EMP, which acts as the primary tool to capture and agree all environmental measures, and the mechanisms for securing them. The ES is based on the assumption that all of these environmental measures will be implemented as part of the Proposed Works.

5.9 Assessment of cumulative effects

5.9.1. A Cumulative Effects Assessment (CEA) has been carried out for the Proposed Works, which evaluates the result from the combined impacts of the Proposed Works with other large-scale developments on the same single receptor or resource (inter-project) and the interaction of environmental aspect effects occurring as a result of the Proposed Works (intra-project).

5.9.2. Inter-project and intra-project effects are considered in **Chapter 21: Cumulative Effects Assessment**, and in specific environmental aspect chapters, where cumulative effects are inherent to that assessment, for example the consideration of dust deposition on biodiversity designations and habitats, within **Chapter 8: Terrestrial Biodiversity and Ornithology**. The inter-projects cumulative effects for landscape and visual receptors are considered in **Chapter 14: Landscape and Visual Impact Assessment (LVIA)**, in accordance with GLVIA3.

Inter-project effects

5.9.3. A range of public sector and industry led guidance is available on CEA, however, at present there is no single agreed industry standard method of assessment. In the absence of a definitive approach, and given the scale of the Proposed Works, professional judgement has been applied, alongside using Planning Inspectorate guidance presented in Advice Note Seventeen[5] as guidance towards the CEA approach[6]. For the Proposed Works, the criteria for assigning certainty to 'other existing development and/or approved development' within Advice Note Seventeen[7] will be applied (see **Table 5-7**).

[5] Planning Inspectorate. (2019). *Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects*. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/#:~:text=This%20Advice%20Note%20seeks%20to,with%20habitats%20regulations%20assessment)%3B (Accessed August 2024).

[6] It is acknowledged that Advice Note 17 applies to Development Consent Order applications. However, Advice Note 17 provides a structured approach to the assessment of cumulative effects and therefore aspects of this approach have been applied to the Proposed Works.

[7] Local Government and Housing Directorate (2023). *National Planning Framework 4*. (Online) Available at: https://www.gov.scot/publications/national-planning-framework-4/documents/ (Accessed August 2024).

Table 5-7 - Criteria for identifying other developments

Hierarchy of other developments	Proposed criteria of other developments	
Tier 1	Under construction or currently undergoing decommissioning such as HPA and HPC.	Decreasing level of detail likely to be available.
	Permitted application(s), where the project is classified as 'major development', whether under the Town and Country Planning Act 1990. or other consent regimes, but not yet implemented.	
	Submitted application(s), where the project is classified as 'major development', whether under Town and Country Planning Act 1990 or other consent regimes, but not yet determined.	
Tier 2	Projects on the Planning Inspectorate's Programme of Projects and/or the relevant local planning authorities planning portal where the project is classified as 'major' development' and a scoping report has been submitted.	
Tier 3	Projects on the Planning Inspectorate's Programme of Projects and/or the subject of pre-application discussion with a relevant Local Planning Authority (LPA), where a scoping report has not been submitted.	
	Identified in the relevant Local Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.	
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.	

5.9.4. The ZoI, within which any potential effects may combine with the effects arising from other developments, has been broadly defined by a nominal search area extending up to 10 km from the Works Area as presented in **Chapter 21: Cumulative Effects Assessment**. Each environmental aspect chapter includes a CEA within which other development relevant to that aspect, has been identified and considered.

5.9.5. In order to ensure that the CEA is proportionate, each of the developments and allocations identified within the ZoI have been considered in terms of whether they would be likely to generate impacts which could combine to result in cumulative effects in combination with the Proposed Works. Criteria used for this process have been specific to each environmental aspect and will take account of scale, nature and timescales.

5.9.6. The other development list and relevant information on these developments was agreed with Somerset Council and frozen in May 2024 prior to submission to allow impact assessments to be completed and reported in this ES. A list of other development is provided in **Chapter 21: Cumulative Effects Assessment** and illustrated on **Figure 21.1**.

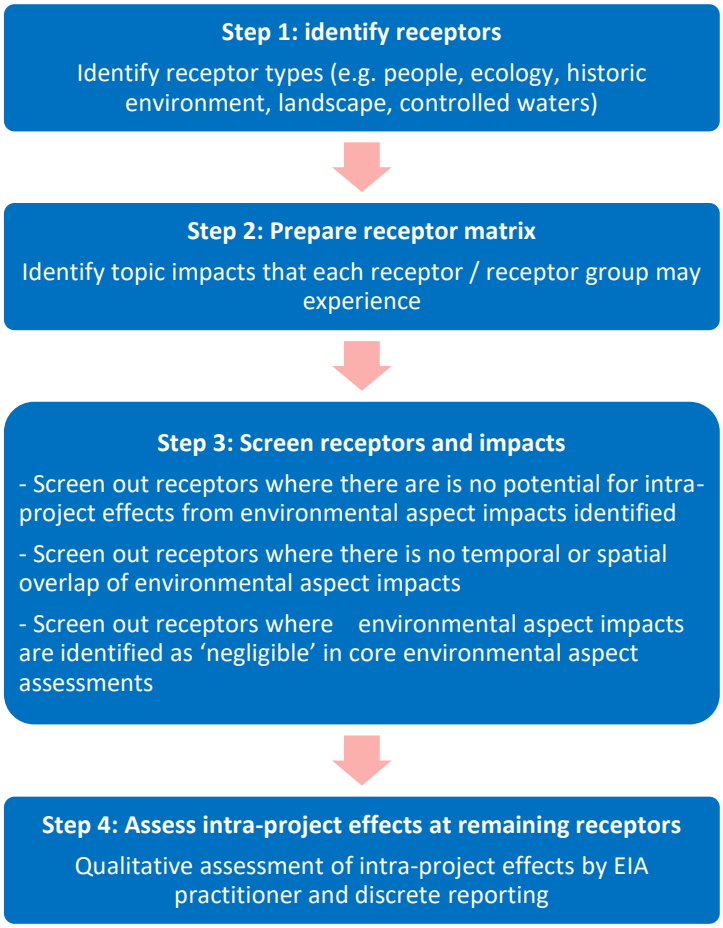
Intra-project effects

5.9.7. The assessment of intra-project effects involves identifying whether any of the individual environmental aspect effects resulting from the Proposed Works, which are not significant in their own right, could combine to create effects that are significant.

5.9.8. There is no standard approach to the assessment of intra-project effects although it is carried out with reference to guidance and to professional judgement. The proposed approach used for the assessment of intra-project effects for the Proposed Works is shown in **Graphic 5-1**.

This follows a receptor-based approach for the consideration of intra-project effects.

Graphic 5-1 - Intra-project effects assessment process



5.10 Transboundary effects

5.10.1. The EIADR[1] requires an ES to consider the transboundary effects of a development (paragraph 5 of part 1 of Schedule 1). Given the nature of the Proposed Works and its location, significant transboundary effects are unlikely. Transboundary effects are considered with reference to Planning Inspectorate Advice Note 12, in **Appendix 5D**.

5.10.2. With specific reference to radiological effects, doses to members of the public in the UK are tightly controlled and regulated in line with the Euratom Basic Safety Standards Directive and the Environmental Permitting (England and Wales) Regulations 2016[8]. Doses to members of the UK population from most nuclear facilities are estimated at below the UK Government's threshold of optimisation (e.g. 20 mSv/y). Discharges during decommissioning are likely to be lower. Furthermore, any discharges will undergo significant dispersion before reaching other states and as such significant transboundary effects are unlikely to occur.

5.11 Assumptions and limitations

5.11.1. Assumptions and limitations are addressed under each environmental aspect as identified in the appropriate chapters (**Chapters 6-20**).

5.12 Structure of ES

5.12.1. The structure of this ES for the Proposed Works follows the order outlined in **Table 5-8** below, and it has acknowledged any changes as a result of the requirements of the Pre-application Opinion provided by the ONR, both in terms of presentation of the Proposed Works to aid understanding, or as the programme of works has evolved.

[8] UK Government (2016). Environmental Permitting (England and Wales) Regulations 2016. (Online), Available at: The Environmental Permitting (England and Wales) Regulations 2016 (legislation.gov.uk) (Accessed August 2024).

Table 5-8 - Structure of the Environmental Statement

ES	Content
VOLUME I: MAIN TEXT	
Chapter 1: Introduction	Overview of the Proposed Works. The Applicant and EIA project team and competency details. Purpose of the ES. Structure of the ES. A brief summary of other relevant assessments and documents (for example, Habitats Regulations Assessment).
Chapter 2: The Decommissioning Process	Description of the Proposed Works and the surroundings. Embedded environmental measures and management measures.
Chapter 3: Alternatives	Alternatives considered and reasons for the choice of preferred options.
Chapter 4: Policy and Legislation	Legislative context. National and local policy context. Other relevant guidance and policies. Other consents, licences and permits required for decommissioning.
Chapter 5: Approach to EIA	The EIA process. EIA terminology. EIA scoping. Stakeholder engagement. Identification of baseline conditions. Overview of assessment methodology. Approach to significance evaluation. Development of environmental measures. Approach to CEA.
Environmental aspect chapters **(Chapters 6-20)**	Introduction. Relevant aspect specific legislation, policy and technical guidance. Consultation and engagement. Data gathering methodology. Baseline description. Scope of the assessment. Embedded environmental and good practice measures.

ES	Content
	Assessment methodology. Limitations and assumptions. Assessment of effects.
Chapter 21: Cumulative Effects Assessment	Assessment of the effects that arise as a result of the Proposed Works with other developments or projects or effects in combination with other environmental aspects on the same receptor or receptor group.
Chapter 22: Summary	Summary of the outcome of the environmental aspect assessments.
VOLUME II: FIGURES	
VOLUME III: APPENDICES	
VOLUME IV: NON-TECHNICAL SUMMARY (NTS)	

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6

Air quality

6 Air quality

6.1 Introduction

6.1.1. This chapter describes the air quality assessment and presents the methodology for assessing potentially significant effects of the Proposed Works.

6.1.2. Potential effects on human and ecological receptors relating to dust emissions as a result of the Proposed Works have been assessed. This chapter describes the key considerations with respect to air quality as they are relevant to Proposed Works.

6.1.3. A screening assessment of road traffic emissions has been undertaken and concludes that the criteria for a detailed assessment are not met as a result of the Proposed Works. This screening assessment has considered the impacts on both human and ecological receptors. These effects have subsequently been assessed qualitatively to justify scoping out of further assessment.

6.1.4. The air quality related aspects which have been scoped out include:

- Point source emissions from combustion plant;
- effects of climate change on air quality;
- emissions of Radionuclides; and
- operational emissions associated with the waste management facilities.

6.1.5. This chapter should be read in conjunction with the description of the Proposed Works as presented in **Chapter 2: The Decommissioning Process**, and **Chapter 16: Traffic and Transport.**

6.1.6. This chapter is supported by the following figures provided in Volume II of this ES:

- Figure 6.1: Monitoring locations; and
- Figure 6.2: Location of nearby receptors

6.1.7. This chapter is also supported by the following appendices provided in Volume III of this ES:

- **Appendix 6A: Air Quality Objectives;** and
- **Appendix 6B: IAQM Construction Assessment Methodology**

6.2 Relevant legislation, policy and technical guidance

Legislation

6.2.1. The legislation in **Table 6-1** is relevant to the assessment of the effects on Air Quality receptors:

Table 6-1 - Legislation relevant to air quality receptors

Legislation	Legislation Issue
The Environmental Protection Act 1990[1]	Part III concerning prevention of statutory nuisance due to emissions from demolition/construction site activities by using Best Practicable Means.

[1] Environmental Protection Act 1990 (Online). Available at: https://www.legislation.gov.uk/ukpga/1990/43/resources (Accessed August 2024)

Legislation	Legislation Issue
The Environment Act 1995[2]	Part IV giving requirements for a National Air Quality Strategy (AQS)[3] and Local Air Quality Management (LAQM) duties for local authorities. Where a local authority determines that one or more objective(s) is/are not likely to be met then it is required to declare one or more Air Quality Management Area (AQMA) and draw up an Action Plan to improve air quality.
The Environment Act 2021[4]	The Environment Act 2021 Schedule 11 includes amendments to Part IV of the Environment Act 1995 concerning the LAQM framework. This is to strengthen the LAQM framework and enable greater cooperation at local level, bringing more organisations into the process of improving air quality. The Act established a legally binding duty on the government to bring two new targets into secondary legislation in October 2022. These included reducing the annual mean levels of $PM_{2.5}$ and reducing public exposure to $PM_{2.5}$ (further information is detailed below).
The Air Quality (England) Regulations 2000 (as amended 2002)[5,6]	Sets ambient Air Quality Objectives as given in the National Air Quality Strategy[3]. The Regulations outline an AQO of 40 µg/m^3 for annual mean concentrations of NO_2 and 40 µg/m^3 for annual mean concentrations of PM_{10}. **Appendix 6A** provides further details relating to the relevant AQOs used in this assessment.
The Air Quality Standards Regulations 2010 (as amended 2016)[7,8]	Setting mandatory limit and target values (amongst other things) for ambient air pollutants to be met at national level. Where exceedance of any limit is determined, the Secretary of State must draw up and implement an Air Quality Plan (which may require a Clean Air Zone) to bring about compliance within the shortest possible time.

[2] Environment Act 1995 (Online). Available at: https://www.legislation.gov.uk/ukpga/1995/25/contents (Accessed August 2024)

[3] Department for Environment, Food and Rural Affairs (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1). (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf (Accessed August 2024)

[4] Environment Act 2021 (Online). Available at: https://www.legislation.gov.uk/ukpga/2021/30/schedule/11/enacted (Accessed August 2024)

[5] The Air Quality (England) Regulations 2000 (Online). Available at: https://www.legislation.gov.uk/uksi/2000/928/contents/made (Accessed August 2024)

[6] The Air Quality (England) (Amendment) Regulations 2002 (Online). Available at: https://www.legislation.gov.uk/uksi/2002/3043/contents (Accessed August 2024)

[7] The Air Quality Standards Regulations 2010 (Online). Available at: https://www.legislation.gov.uk/uksi/2010/1001/contents/made (Accessed August 2024)

[8] The Air Quality Standards (Amendment) Regulations 2016 (Online). Available at: https://www.legislation.gov.uk/uksi/2016/1184/contents/made (Accessed August 2024)

Legislation	Legislation Issue
Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[9]	Includes an amendment to the Air Quality Standards Regulations 2010 limit value for $PM_{2.5}$ to 20 µg/m^3.
The Environment Targets (Fine Particulate Matter) (England) Regulations 2023[10]	Brings into law the following new long-term targets for $PM_{2.5}$: Annual mean concentration target for a maximum concentration of 10µg/m^3 to be met across England by 2040; and Population exposure reduction target for a 35% reduction in population exposure by 2040 (compared to a base year of 2018).
The Environmental Improvement Plan 2023[11]	Sets out the following additional interim targets for $PM_{2.5}$, to be achieved by the end of January 2028: The highest annual mean concentration in the most recent full calendar year must not exceed 12µg/m^3 of $PM_{2.5}$. Compared to 2018, the reduction in population exposure to $PM_{2.5}$ in the most recent full calendar year must be 22% or greater.

Policy

6.2.2. A summary of the relevant policies is given in **Table 6-2**.

Table 6-2 - Policy relevant to air quality

Policy Reference	Policy Relevance
National Policy	
UK Air Quality Strategy (2023)[12]	This document provides a framework to enable local authorities to make improvements in their communities and sets actions that Defra expects local authorities to take to support air quality goals.
Clean Air Strategy 2019[13]	Defra published the Government's Clean Air Strategy in 2019. This sets out measures which aim to reduce emissions from all sources of air pollution,

[9] The Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020) – Statutory Instrument No.1313 (Online). Available at: https://www.legislation.gov.uk/uksi/2020/1313/regulation/1/made (Accessed August 2024)

[10] HM Government (2023), Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (Online). Available at: https://www.legislation.gov.uk/uksi/2023/96/contents/made (Accessed August 2024)

[11] HM Government (2023), Environmental Improvement Plan 2023 – First Revision of the 25 Year Environment Plan (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf (Accessed August 2024)

[12] Defra (2023), Air quality strategy: framework for local authority delivery (Online) Available at: The air quality strategy for England - GOV.UK (www.gov.uk) (Accessed August 2024)

[13] Defra (2019). Clean air strategy 2019. (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf (Accessed August 2024)

Policy Reference	Policy Relevance
	making air healthier to breathe, protecting nature and boosting the economy. The Strategy also provides goals to reduce public exposure to airborne particulate matter, as per the recommendation made by the WHO. Furthermore, the Strategy confirms that the Government will set new legislation to "*create a stronger and more coherent framework for action to tackle air pollution, in line with the risk they pose to public health and the environment, plus new local powers to take action in areas with an air pollution problem. These will support the creation of Clean Air Zones to lower emissions from all sources of air pollution, backed up with clear enforcement mechanism.*" New enforcement powers will also be given at a national and local level, across all sectors of society.
National Planning Policy Framework (NPPF)[14]	A key part of the Government's reforms to make the planning system less complex and more accessible. The NPPF acts as guidance for local planning authorities and decision-takers, both in drawing up plans and making decisions about planning applications. Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development. Paragraph 192 states that policies and decisions should sustain and contribute towards compliance with relevant air quality objectives.
The UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations[15]	Published in 2017, this plan sets out roles and responsibilities and measures for bringing NO_2 levels within the mandatory limit values in the shortest possible time.
Local Policy	
Adopted West Somerset Local Plan to 2032 (2016)[16]	Policy NH9 aims to avoid pollution or nuisance from new development. The policy states that: "*Development that generates atmospheric emissions which would cause harm to human health, senses or property will not be permitted and where such uses exist the local planning authority will not permit sensitive other uses within a reasonable distance of such uses*." Policy NC/1 is retained within the updated West Somerset Local Plan derived from the 2006 West Somerset District Local Plan. This policy is concerned with the protection of Sites of Special Scientific Interest (SSSIs) and states that development proposals that may have the potential to affect an SSSI will not be permitted unless: "(i) *there are no alternative means of meeting the development need, and*

[14] Department for Levelling Up, Housing and Communities (2023). National Planning Policy Framework. (Online). Available at: National Planning Policy Framework (publishing.service.gov.uk) (Accessed January 2024).

[15] Defra (2017). UK plan for tackling roadside nitrogen dioxide concentrations Detailed plan (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/633270/air-quality-plan-detail.pdf (Accessed August 2024).

[16] West Somerset Council (2016). West Somerset Local Plan to 2032 (Online). Available at: https://offlinehbpl.hbpl.co.uk/NewsAttachments/RLP/West_Somerset_Adopted_Local_Plan.pdf (Accessed August 2024).

Policy Reference	Policy Relevance
	(ii) the reasons for the development clearly outweigh the value of the site and the national policy to safeguard the nature conservation value of the national network of such sites."
Draft Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) (2020)[17]	The Local Plan 2040 covers the whole of the new Somerset West and Taunton area. Objective 9 of this document contains 7 policy approaches will help meet this objective. Policy approach 9a/5 is to: "*Ensure that air quality, pollution, contaminated land, noise, nuisance, smell, land instability are considerations for planning applications*." As stated in **Chapter 4: Policy and Legislation Overview** Somerset West and Taunton (SWT) are no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council. A new Development Plan is not anticipated to be in place prior to the submission of the ES.
Sedgemoor Local Plan (2011-2032)[18]	Policy D24 states: "*Development proposals that are likely to result in levels of air, noise, light or water pollution (including groundwater), vibration or soil contamination that would be unacceptably harmful to other land uses, human health, tranquillity, or the built and natural environment will not be supported*." If a development is proposed to result in a significant environmental impact, D24 states that the planning application must be supported by an assessment in air quality, amongst others. This air quality chapter will address the impacts of the Proposed Works on emissions of Nitrogen Dioxide (NO_2), NO_x, Particulate Matter (PM_{10} and $PM_{2.5}$) to air.

Technical guidance

6.2.3. **Table 6-3** reports the technical guidance relevant to air quality.

[17] Somerset West and Taunton (2020). Local Plan 2040 Issues and Options document (Online). Available at: https://democracy.somerset.gov.uk/Data/SWT%20Executive/201911201815/Agenda/Appendix%20A%20Local%20Plan%20Issues%20and%20Options.pdf (Accessed August 2024).

[18] Sedgemore District Council (2019). The Sedgemoor Local Plan (Online). Available at: https://www.somerset.gov.uk/housing-support/affordable-home-ownership/advice-for-developers-in-sedgemoor/#contents (Accessed August 2024).

Table 6-3 - Technical guidance relevant to air quality

Technical Guidance	Context
Local Air Quality Management Technical Guidance 2022 (LAQM.TG22)[19]	Provides guidance for technical officers and local authorities to discharge their obligations under the LAQM regime. It contains guidance on numerous areas including, for example, screening tools and methodologies, air quality monitoring, estimating emissions and dispersion modelling.
Guidance on the Assessment of Dust from Demolition and Construction (2024)[20]	Provides a four-step process for evaluating the risk associated with dust emissions from construction and demolition sites on different types of receptor to dust soiling, health effects and ecological effects.
Guidance on Monitoring in the Vicinity of Demolition and Construction Sites (2018)[21]	Provides updated guidance on air quality monitoring in the vicinity of demolition and construction sites. To be applied in conjunction with the guidance on the assessment of dust from demolition and construction.
Guidance on Land-Use Planning & Development Control: Planning for Air Quality (2017)[22]	The Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) has produced guidance regarding the assessment of air quality issues within planning applications, which includes a summary of relevant legislation and the methodology to apply to assess significance.
Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (2020)[23]	Provides guidance on the air quality impacts of development on designated nature conservation sites but establishes that the assessment of the effects that air quality impacts may have on habitats and species should be the responsibility of a suitability qualified and experienced ecologist.
Air Quality Guidelines for Europe (2000)[24] and Air Quality Guidelines Global Update (2005)[25]	These documents provide health-based air quality guidelines for a number of pollutants and critical levels for biodiversity receptors.

[19] Defra (2023) LAQM Technical Guidance. (Online). Available at: https://laqm.defra.gov.uk/air-quality/featured/uk-regions-exc-london-technical-guidance/ (Accessed August 2024).

[20] IAQM (2024). IAQM guidance on the assessment of dust from demolition and construction, Version 2.2 (Online). Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf (Accessed August 2024).

[21] IAQM. (2018). Guidance on Monitoring in the Vicinity of Demolition and Construction Sites, Version 1.1. (Online). Available at: http://iaqm.co.uk/text/guidance/guidance_monitoring_dust_2018.pdf (Accessed August 2024).

[22] IAQM & EPUK (2017). Land-Use Planning & Development Control: Planning For Air Quality. (Online). Available at: https://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf (Accessed August 2024).

[23] IAQM (2020). A guide to the assessment of air quality impacts on designated nature conservation sites, Version 1.0 (Online) Available at: https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2020.pdf (Accessed August 2024).

[24] WHO. (2000). Air Quality Guidelines for Europe. (Online). Available at: E71922.pdf (who.int) (Accessed August 2024)

[25] WHO. (2005). Air Quality Guidelines Global Update 2005. (Online). Available at untitled (who.int) (Accessed August 2024).

Technical Guidance	Context
Guidance on Decision-making Thresholds for Air Pollution[26]	This guidance document informs the assessment of air quality impacts on designated conservation sites. The report provides criteria for AADT flows, below which it can be reasonably assumed that their effect will not undermine the achievement of the conservation objectives or result in a significant effect. This decision can be made without further assessment effort.
Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the habitats regulations[27]	This guidance note is referred to as best practice and describes how Natural England advises competent authorities and others on the assessment of plans and projects likely to generate road traffic emissions to air which are capable of affecting European Sites. The note provides a threshold of 1% or less of a European Site's Critical Load (CL) where long term pollution is expected to be nonconsequential.

6.3 Data gathering methodology

Desk study

6.3.1. The baseline desk study has been undertaken with reference to **Chapter 2: The Decommissioning Process** and is supported by a number of data sources. The principal data sources used to inform this chapter for potential effects comprise of the following:

- Mapped estimates of background concentrations from UK AIR (Air Information Resource)[28].
- Mapped estimates of background concentrations and deposition rates provided by the UK Air Pollution Information System (APIS).
- Reports providing air quality monitoring data29,30 produced by SWT and Sedgemoor District Council (SDC) under their LAQM obligations.
- Aerial imagery (Google Earth Pro (imagery date June 2023) and Ordnance Survey maps).
- Hinkley Point B (HPB) Environmental permit (EP3334LZ) and annual pollution inventory (PI) reports.

[26] JNCC (2021). Guidance on Decision-making Thresholds for Air Pollution. (Online) Available at: Main Report: Guidance on Decision-making Thresholds for Air Pollution (jncc.gov.uk) (Accessed August 2024).

[27] Natural England (2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the habitats regulations. (Online). Available at: https://publications.naturalengland.org.uk/publication/4720542048845824 (Accessed August 2024).

[28] Defra (2018). UK-AIR Background Mapping data for local authorities. (Online). Available at: https://uk-air.defra.gov.uk/data/laqm-background-home (Accessed August 2024).

[29] Somerset West and Taunton Council (2023). *2022 Air Quality Annual Status Report (ASR).* (Online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Environment and Food Safety/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FEnvironment and Food Safety%2FSomerset West and Taunton - Air Quality Report 2022%2Epdf&parent=%2Fsites%2FSCCPublic%2FEnvironment and Food Safety&p=true&ga=1 (Accessed August 2024).

[30] Sedgemoor District Council (2023). *2022 Air Quality Annual Status Report (ASR)*. (Online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Environment and Food Safety/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FEnvironment and Food Safety%2FSedgemoor - Air Quality Report 2022%2Epdf&parent=%2Fsites%2FSCCPublic%2FEnvironment and Food Safety&p=true&ga=1 (Accessed August 2024).

Survey work

6.3.2. No surveys have been undertaken to inform this air quality chapter. Within the vicinity of the Site, Hinkley Point C Nuclear Power Station (HPC) is under going construction and undertakes regular air quality monitoring, which has been referenced in this assessment.

6.3.3. Data from four environmental monitoring stations associated with HPC that record real-time dust, PM10 and PM2.5 emissions demonstrate low level of PM10 and PM2.5 in the area with concentrations well below the objective/limit. For the period between 21/03/23 and 31/05/24, the average data is shown below in **Table 6-4** below. In addition, trigger levels have been set in the HPC construction management plans that require mitigation to be implemented by HPC when the levels are breached. Where the emissions are prolonged and over certain limits HPC is also required to notify Somerset Council.

Table 6-4 - EDF dust monitoring stations during the period 21 March 2024 and 31 May 2024

Site ID	Data capture	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
Yellow Door	99.8	10.6	6.5
Headweir	92.9	8.7	5.7
Doggetts	97.9	11.5	7.1
Glebe House	100	11.0	6.3

6.3.4. Therefore, it is considered that data available from UK AIR and local authority monitoring are sufficient to inform the air quality baseline.

Data limitations

6.3.5. At the time of writing, the most recent air quality Annual Status Reports (ASRs) available are from 2022. Therefore, the most recent local authority monitoring data included in this assessment are from 2021.

6.4 Consultation

Pre-application opinion

6.4.1. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the assessment of effects of air quality and confirmation of how these are addressed by the assessment is included in **Table 6-5**.

Table 6-5 - Summary of Pre-application opinion responses

Consideration	How addressed in the ES
Where multiple Study Areas have been defined for a topic area, it should be clear how they have been defined and whether they are the Study Areas for the purposes of the scoping exercise or the EIA. For example, in **Chapter 5: Approach to EIA**, a Study Area for decommissioning traffic movements and road traffic emissions is provided but the Study Area for dust risk assessments is omitted.	The Study Areas and methodology for defining Study Areas are outlined in **Section 6.9**.

Non-statutory consultation

6.4.2. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

6.4.3. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

6.4.4. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report.** Comments relevant to the air quality assessment are summarised in **Table 6-6.**

Table 6-6 – Comments received during non-statutory consultation relevant to the air quality assessment

Respondent	Comment received	Response
Round 1 consultation		
Sedgemoor District Council	Support for the inclusion of local air quality in scoping and that Sedgemoor area is scoped into the Study Area.	Response noted.
Sedgemoor District Council	Support for the assessment approach to local air quality, noting that the Sedgemoor area is scoped into the Study Area.	
Round 2 consultation		
Somerset Council	**Air Quality, Noise and Vibration**	Noted. This chapter refers to embedded environmental measures defined in **Section 6.6**

Respondent	Comment received	Response
	With regards to the sections of your latest Consultation Document that deal with Air Quality, Noise and Vibration, the Council's Environmental Health Officer considers that these sections outline the potential for the works to affect the area, although it is noted that you are expecting any impact to be minimal. The Consultation document references the need to produce an Environmental Management Plan (EMP), which the Council sees as being key to dealing with these issues. The EMP should give more specific and detailed information about any risks and how these can be reduced or managed.	and secured via the **Environmental Management Plan (EMP).**

Technical engagement

6.4.5. No additional technical engagement has been undertaken with respect to the air quality assessment.

6.5 Overall baseline

6.5.1. The Site lies within the jurisdiction of Somerset Council, which was founded 1 April 2023 and is made up of Mendip District Council, Sedgemoor District Council (SDC), Somerset West and Taunton Council (SWTC) and South Somerset District Council. The Site lies within the previous SWTC, and therefore, local air quality management undertaken by SWTC and its jurisdictional area has informed the Baseline Study Area. The preferred route reported within **Chapter 15: Noise and Vibration** demonstrates that traffic associated with the Proposed Works has the potential to impact local air quality within both SWTC and Sedgemoor District Council (SDC). Therefore, local air quality management undertaken by SDC and its jurisdictional area has also informed the Baseline Study Area.

Current baseline

6.5.2. There are two AQMAs declared by SWTC. The first is located on the A358 trunk road in Henlade, 23 km south of the Works Area, and the second is located on East Reach Road which is 22 km south of the Works Area. Given the distance between the Works Area and the AQMAs it is not anticipated that they will be affected by the Proposed Works at the Works Area or with respect to traffic generated by the works. There are no AQMAs declared by SDC.

6.5.3. The Site is in a predominantly rural setting, within the Hinkley Point Complex which includes Hinkley Point A Nuclear Power Station (HPA), HPB, and HPC. HPA is currently undergoing

decommissioning and is within its Pre Care and Maintenance phase[31], scheduled to enter Care and Maintenance[32] in 2040. HPC is currently under construction and is planned to begin operations around the end of the decade. Therefore, fugitive dust emissions from activities associated with HPA and HPC works are accounted for within existing air quality baseline monitoring.

6.5.4. Defra provides data for background concentrations of Nitrous Oxides (NOX), Nitrogen Dioxide (NO2) and Particulate Matter (PM10 and PM2.5). These background concentrations are provided for 1 km2 grid squares within the area of each administrative authority. The background concentrations of each pollutant which are applicable to the location of the Site for 2024 are presented in **Table 6-7**.

Table 6-7 - Annual mean pollutant background concentrations (µg m-3) (2024)

Grid square	NO_2	NO_x	PM_{10}	$PM_{2.5}$
321500, 145500	3.5	4.3	9.2	5.7

Source: Defra, UK-AIR background mapping data for local authorities[28]

Passive monitoring

6.5.5. Both SWTC and SDC in 2021, undertook non-automatic (passive) monitoring of NO2. Details of the passive monitoring sites within SWTC and SDC areas that are closest to the Site and the A39 are presented in **Table 6-8** and **Table 6-10**respectively. Site types used in the table are those determined by the respective Councils. The locations of the monitoring sites are presented in Figure 6.1.

6.5.6. Monitoring has been undertaken by SWTC during the period 2017 to 2021[33] (see **Table 6-9**). The closest sites operated by SWTC to the Site are monitoring sites 101, 102 and 105.

6.5.7. Monitoring has also been undertaken by SDC during the period 2017 – 2021[33] (see **Table 6-11**. The closest monitoring sites operated by SDC to the Site are DT29 and DT30.

6.5.8. The monitoring data indicated that the annual mean NO_2 concentrations in SWTC and SDC are well within the AQS objective for NO_2.

6.5.9. The Site lies within a rural environment, and therefore air quality can reasonably be assumed to be better at the Site than that reported for the monitoring sites located next to roads shown below.

[31] Equivalent to the Preparations for Quiescence phase of the Proposed Works.

[32] Equivalent to the Quiescence phase of the Proposed Works.

[33] At the time of writing (July 2024), this is the most recent monitoring reporting period at these locations by the relevant local authority (prior to the creation of the Somerset Council Unitary Authority – see paragraph 6.5.1).

Table 6-8 - Details of passive monitoring locations - SWTC

Site ID	Site name	Site type	X (m)	Y (m)	Distance to kerb (m)	Distance to the Site (km)
Somerset West and Taunton Council						
55	Obridge/Priorswood Rd	Roadside	323491	125906	3	19.7
56	St Andrews Road	Roadside	322675	125729	1	19.8
59	Bindon Road/ Silk Mills	Kerbside	320668	125950	5	19.5
60	Greenway Road	Roadside	322329	125893	4	19.6
101	County Stores, Williton	Roadside	307737	140954	0.5	13.8
102	Post Office, Williton	Roadside	307715	141013	0.5	13.8
103	May Terrace, Washford	Roadside	297804	145956	0.5	22.9
104	Egremont Court	Roadside	296950	146248	0.5	23.8
105	Vulcan Rd, Minehead	Roadside	304694	141030	0.5	16.7
106	The Avenue, Minehead	Roadside	297700	145164	0.5	23.0

Table 6-9 - Monitored annual mean concentrations of NO_2 - SWTC

Site ID	Data capture 2021	Annual mean concentrations of NO_2 (μgm^{-3})				
		2017	2018	2019	2020	2021
55	92.3	18	24	19	16	14
56	100	27	34	26	23	20
59	100	22	27	22	19	17
60	100	21	23	18	16	14
101	100	26	34	27	20	21

Site ID	Data capture 2021	Annual mean concentrations of NO_2 (μgm^{-3})				
		2017	2018	2019	2020	2021
102	100	28	32	27	23	21
103	82.7	12	17	14	13	10
104	92.3	17	33	26	22	19
105	100	14	16	15	13	10
106	84.6	13	21	18	12	12

Table 6-10 - Details of passive monitoring locations - SDC

Site ID	Site name	Site type	X (m)	Y (m)	Distance to kerb (m)	Distance to the Site (km)
Sedgemoor District Council						
DT30	Cannington (W)	Roadside	325331	139509	2.3	7.3
DT29	Cannington (E)	Roadside	325523	139600	2.2	7.3
DT12	Church Street	Roadside	331972	147301	2.2	10.4
DT11	Clover Way	Suburban	332173	147968	2.1	10.7
DT33	Bristol Rd, Dunball	Roadside	331130	140751	2	10.8
DT28	Quantock Road (North)	Roadside	328247	137062	1.8	11.0
DT21	Quantock Rd (RAB)	Roadside	328409	137081	1.5	11.1
DT1	Carlton Drive	Suburban	329611	138122	1.7	11.1
DT27	Quantock Road (S)	Roadside	328650	136967	1.5	11.3
DT36	Chilton Street	Roadside	329823	137838	1	11.5
DT2	Camden Road	Suburban	329472	137301	1.2	11.6

Site ID	Site name	Site type	X (m)	Y (m)	Distance to kerb (m)	Distance to the Site (km)
DT20	East Quay	Roadside	330157	137965	2.5	11.6
DT26	Wembdon Road	Roadside	329076	136899	2.3	11.6
DT25	Bristol Road (N)	Roadside	330631	138146	3	11.9
DT3	West Street	Roadside	329471	136928	0.8	11.9
DT32	Bristol Road (S)	Roadside	330562	137821	2	12.0
DT9	Monmouth St (N)	Roadside	330456	137391	1.7	12.2
DT8	Monmouth St (S)	Roadside	330388	137263	1.9	12.3
DT24	Bath Road	Roadside	330942	137801	4	12.3
DT6	St Saviours Avenue	Suburban	330061	136858	1.6	12.3
DT7	Salmon Parade	Roadside	330171	136912	0.9	12.4
DT23	Parkway	Roadside	331328	138101	2.2	12.5
DT35	St John Street	Roadside	330429	137054	2.9	12.5
DT31	Taunton Road (N)	Roadside	330072	136452	2.3	12.6
DT34	Sedgemoor Road	Roadside	331149	136653	3.5	13.3
DT22	Taunton Road (S)	Roadside	330331	135726	2.7	13.4
DT18	Huntworth	Roadside	330584	134059	2.2	14.8
DT15	Mendip Road	Roadside	336112	152946	1.9	16.0

Site ID	Site name	Site type	X (m)	Y (m)	Distance to kerb (m)	Distance to the Site (km)
DT13	Rooksbridge M5	Roadside	336300	153380	1.2	16.4
DT14	Rooksbridge Road	Suburban	336378	153293	2.9	16.4
DT17	Manson's Way	Suburban	346306	153243	3.1	25.7
DT16	Cheddar George	Suburban	346482	153905	1.3	26.0

Table 6-11 - Monitored annual mean concentrations of NO_2 - SDC

Site ID	Data capture 2021	Annual mean concentrations of NO_2 (μgm^{-3})				
		2017	2018	2019	2020	2021
DT30	100	9.2	10.4	10.8	7.1	7.4
DT29	100	12.8	13.5	13.1	8.9	9.5
DT12	100	22.8	24.3	24.8	17.0	19.4
DT11	100	14.1	13.5	12.4	9.7	10.8
DT33	100	34.3	32.4	29.4	26.0	29.0
DT28	83	32.7	33.9	31.9	26.3	30.0
DT21	100	24.8	25.3	24.8	18.0	19.9
DT1	100	12.3	13.6	12.6	9.3	10.1
DT27	100	24.2	23.7	24.9	15.1	17.9
DT36	100	0.0	15.5	15.4	12.1	12.5
DT2	100	13.0	14.1	13.7	10.7	10.7
DT20	100	19.9	24.2	21.1	15.8	18.6
DT26	100	25.3	26.6	24.6	18.9	20.5
DT25	100	27.1	27.7	22.4	20.3	21.2

Site ID	Data capture 2021	Annual mean concentrations of NO_2 (μgm^{-3})				
		2017	2018	2019	2020	2021
DT3	100	25.5	25.4	22.4	18.6	21.3
DT32	100	29.4	33.9	30.1	24.6	27.1
DT9	100	35.9	35.6	34.5	28.3	29.5
DT8	100	26.0	28.4	28.7	30.3	32.1
DT24	100	23.3	25.8	22.8	18.4	20.3
DT6	100	20.2	19.8	19.8	14.4	15.1
DT7	100	23.9	23.3	23.2	17.2	19.6
DT23	100	22.7	23.1	22.1	17.4	18.6
DT35	100	0.0	27.4	25.9	20.3	22.0
DT31	100	32.0	40.4	30.2	21.0	22.5
DT34	100	0.0	22.0	19.5	15.6	17.6
DT22	100	26.0	27.3	25.9	18.7	20.8
DT18	100	28.8	27.7	24.2	19.6	20.1
DT15	92	16.9	16.0	14.1	9.9	11.1
DT13	100	25.5	23.1	19.7	15.7	26.1
DT14	100	17.4	17.2	14.8	10.2	8.1
DT17	100	9.1	8.7	7.7	5.8	6.2
DT16	67	8.9	8.9	7.9	5.5	7.8

6.5.10. The recent 2022 SDC ASR concluded that a continued low level of NO_2 in the District with concentrations well below the objective/limit, and relative stability over the previous five years (2017 to 2021[33]) with a general downwards trend.

6.5.11. NO_2 levels in 2021 show a small increase on concentration from 2019 and 2020 as the road traffic began to return to normal following the lifting of Covid-19 restrictions. However, the NO_2 levels in 2021 show a reduction when compared to 2017.

Automatic monitoring

6.5.12. SWTC did not undertake any automatic (continuous) monitoring during 2021.

6.5.13. SDC has four automatic monitors (Aerosol monitor) for PM10 and PM2.5 monitoring in the District. Details of the PM automatic monitoring sites within SDC are presented in **Table 6-12** and **Table 6-13**.

Table 6-12 - Details of automatic monitoring locations - SDC

Site ID	Site name	Site type	X (m)	Y (m)	Distance to kerb (m)	Distance to the Site (m)
Sedgemoor District Council						
PM4	Quantock Road	Roadside	328164	137074	10	10.9
PM1	Bristol Road	Roadside	330691	138490	2	11.7
PM2	West Bow House	Roadside	329458	136922	16	11.9
PM3	Taunton Road	Roadside	330030	136644	6	12.5

Table 6-13 - Monitored annual mean concentrations of PM_{10} and $PM_{2.5}$ - SDC

Site ID	Data capture 2021	Annual mean concentrations of PM_{10} (μgm^{-3})				
		2017	2018	2019	2020	2021
PM4	100	-	10.8	14.3	10.4	7.0
PM1	93	-	13.9	11.8	9.1	7.3
PM2	90	-	12.0	11.5	8.5	8.1
PM3	90	-	10.7	11.9	9.2	8.4

Site ID	Data capture 2021	Annual mean concentrations of $PM_{2.5}$ (μgm^{-3})				
		2017	2018	2019	2020	2021
PM4	100	-	11.8	10.0	7.3	5.8
PM1	93	-	9.6	10.3	7.3	6.6
PM2	90	-	9.2	10.7	7.6	7.1

Site ID	Data capture 2021	Annual mean concentrations of $PM_{2.5}$ (μgm^{-3})				
		2017	2018	2019	2020	2021
PM3	90	-	9.2	13.4	9.0	5.8

6.5.14. The 2022 SDC ASR concluded that a continued low level of PM_{10} and $PM_{2.5}$ in the District with concentrations well below the objective/limit, and relative stability over the previous four years (2018 to 2021) with a general downwards trend.

Emission sources in the local area

Emissions originating from HPB comprise traffic emissions associated with the operational workforce and historically, point source emissions from the auxiliary boilers and periodic testing of the standby diesel generators. During the operation of HPB, operational traffic increases occurred periodically due to outages, but the effects from these emissions and those from the construction of HPC and the decommissioning of HPA are considered within the baseline characterisation. Emissions from the auxiliary boilers and standby generators are regulated under the Site's permit (Permit number EPR/EP3334LZ).

Future baseline

6.5.15. It is expected there would be a gradual reduction in air pollutant concentrations as a result of expected improvements in air quality resulting from the implementation of the Government's Clean Air Strategy[13] objectives; improvements in real world emissions performance of road vehicles and more stringent emission limits for industrial sources as environmental permits for operators covering the various industrial sectors are updated in a phased manner to bring them in line with the requirements of the Industrial Emissions Directive.

6.5.16. Emissions associated with the decommissioning of HPA will reduce in future years, with Final Site Clearance of HPA will commence in approximately 2085 after entering Care and Maintenance in approximately 2040.

6.5.17. HPC is currently under construction, with operation predicted around the end of the decade. Upon completion of construction, emissions associated with HPC will likely comprise primarily traffic emissions associated with the operational workforce movements and point source emissions from the auxiliary boilers and periodic testing of the standby diesel generators.

6.5.18. Defra estimates background pollutant concentrations on a 1 km^2 grid for the UK for seven of the main pollutants, including NO_X, NO_2, PM_{10} and $PM_{2.5}$. Projected future year background concentrations of NO_X, NO_2, PM_{10} and $PM_{2.5}$ are reported in **Table 6-14**. These background concentrations are reported for the Works Area and show a general downward trend in pollutant concentrations. These pollutant concentrations reflect the rural nature of the area.

Table 6-14 - Annual mean pollutant background concentrations (µg m^{-3})

Pollutant	2025	2026	2027	2028
NO_x	4.2	4.1	4.1	4.0
NO_2	3.4	3.3	3.3	3.2
PM_{10}	9.1	9.1	9.1	9.1
$PM_{2.5}$	5.7	5.7	5.7	5.6

Source: Defra, UK-AIR background mapping data for local authorities[28]
Background annual mean concentrations of pollutant at centre of grid square 321500,146500. 2018 base year (µg m^{-3})

6.6 Embedded environmental measures

6.6.1. Good practice air quality measures as described in the IAQM guidance on the Assessment of Dust from Demolition and Construction will be employed across the Project and incorporated in the EMP. These are reported in detail in **Table 6-15.**

Table 6-15 - Summary of embedded environmental measures

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
Appropriate Dust Management Plan(s) will be produced for demolition activities as part of the Proposed Works, in accordance with IAQM guidance on the Assessment of Dust from Demolition and Construction. The DMP will include good practice measures, such as those provided in **Table 6-23**.	EMP	Embedded measure

6.7 Assessment methodology

6.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4.** However, whilst this has informed the approach that has been used in this air quality chapter, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the air quality assessment in the Environmental Statement (ES).

General approach

6.7.2. The methodological approach to the air quality assessment that has been undertaken is described below in paragraphs 6.7.3. to 6.7.9.

Dust emissions

6.7.3. Using the IAQM Guidance on the assessment of dust from demolition and construction20, a desk-based assessment to assess the effects of dust emissions associated with the Proposed Works has

been undertaken. **Appendix 6B** provides further detail for the methodology reported within the IAQM guidance.

6.7.4. The dust emitting activities that may take place during the Proposed Works include:

- Demolition – an activity involved with the removal of an existing structure or structures;
- Earthworks – the processes of soil-stripping, ground-levelling, excavation and landscaping;
- Construction – an activity involved in the provision of a new structure; and
- Activities that cause trackout – the transport of dust and dirt from the site onto the public road network. This arises when HGVs leave site with dusty materials or transfer dust and dirt onto the road having travelled over unpaved ground on-site.

6.7.5. IAQM Guidance[20] requires the consideration of three separate dust impacts:

- Annoyance due to dust soiling;
- the risk of health impacts due to an increase in exposure to PM_{10}; and
- harm to ecological receptors.

6.7.6. Detailed air quality assessment involves a three-stage process:

- Stage 1 – areas where there are expected to be dust emitting activities are classified according to the risk of dust impacts (based upon the scale and nature of the works, taking into account the proximity of sensitive receptors);
- Stage 2 – appropriate site-specific mitigation measures are identified; and
- Stage 3 – the significance of effects is then determined.

6.7.7. The magnitude of dust emitting activities and the sensitivity of the area surrounding the Proposed Works has been concluded first and has been considered as part of a matrix to determine the risk of dust impacts for the four dust generating activities (demolition, earthworks, construction and track out). The magnitude of dust emitting activities is based on the scale of activities associated with the Proposed Works and was categorised as small, medium or large[20] (see **Table 6-16**).

Determination of significance

6.7.8. To consider the significance of the dust emissions associated with the Proposed Works, the risk of dust impacts has been determined first. This process is described as ‘Stage 1’ in Paragraph 6.

6.7.9. The risk of impacts has been defined as either high, medium, low or negligible. This categorisation was based upon professional judgement and the guiding principles in IAQM guidance[20] (see **Table 6-16**).

6.7.10. Based on the overall risk assessment for the four activities, site specific mitigation has been proposed. These mitigation measures will be identified within a Dust Management Plan. The approach to determine the most applicable or effective mitigation measures, for the risk level determined, was based upon professional judgement and the guiding principles presented in IAQM guidance[20].

6.7.11. The significance of dust emission impacts is best determined after site-specific mitigation measures are applied, in accordance with IEMA, IAQM guidance[20] and standard practice. The approach to concluding significance that has been undertaken is, again, in line with the IAQM guidance[20] which reports that significant effects on receptors are prevented through the application of effective mitigation. Furthermore, this concludes that the residual effect is ‘**Not Significant’**.

Table 6-16 Matrices for determining risk of impacts from dust

Category Type	Sensitivity of Area	Dust Emission Magnitude		
		Large	Medium	Small
Demolition	High	High Risk	Medium Risk	Medium Risk
	Medium	High Risk	Medium Risk	Low Risk
	Low	Medium Risk	Low Risk	Negligible
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Trackout	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Low Risk	Negligible
	Low	Low Risk	Low Risk	Negligible

Road traffic emissions

6.7.12. A screening assessment has been undertaken to consider the impact of road traffic emissions associated with the Proposed Works. EPUK and IAQM[22] provide guidance on when it is appropriate to carry out a detailed air quality assessment of a development that generates road traffic.

6.7.13. The screening assessment considers the impact of road traffic emissions on both human and ecological receptors. The key criteria that have been used for screening the impact on human receptors are presented in **Table 6-17**. The IAQM guidance on air quality impacts on designated nature sites[23] has been used as the primary basis for screening the impacts from road traffic emissions on ecological receptors.

Table 6-17 - Screening criteria for detailed air quality assessment of road traffic emissions

Nature of Impact	Screening criteria for a detailed air quality assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors (LDV = cars and small vans <3.5t gross vehicle weight)	A change of LDV flows of: more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA; and more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of: more than 25 AADT within or adjacent to an AQMA; and more than 100 AADT elsewhere.
Realign roads, i.e. changing the proximity of receptors to traffic lanes	Where the change is 5 m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors	The introduction of a new junction or removal of a junction will lead to a detailed air quality assessment when this addition/removal causes traffic to significantly change vehicle acceleration or deceleration, e.g. traffic lights, or roundabouts.

6.8 Scope of the assessment

Study Area

6.8.1. There are different Study Areas for different emissions to air associated with the Proposed Works. Each emission source has a different Zone of Influence (ZoI) which is dependent upon the location of the emission source, the magnitude of the emissions, the extent to which they are anticipated to be dispersed and diluted in the atmosphere, and the relative location of the sensitive human and ecological receptors.

6.8.2. The methodological approach to define the spatial extent of the relevant Study Areas for air quality has been informed by the IAQM guidance and the EPUK and IAQM guidance. Details of the approach to determining the Study Areas for dust and fine particulate emissions are provided below.

6.8.3. As part of the response to ONR's consultation on the Scoping Report, Natural England made comments in relation to the consideration of combustion emissions from mobile diesel generators. The potential contribution of combustion emissions from mobile diesel generators was scoped out of the assessment on the basis that where required, power supplies will connect to the mains rather than diesel fuelled mobile generators**.**

Dust and fine particle emissions

6.8.4. The phases of the Proposed Works which may include the undertaking of activities with the potential to give rise to dust and fine particle emissions are the Preparations for Quiescence phase and Final Site Clearance phase. The activities associated with these phases of the Proposed Works include demolition, construction, general earthworks and vehicle movements. These activities could cause

dust and fine particulates to be generated directly by the works and also have the potential to result in track-out of material beyond the Works Area boundary as a result of vehicle movements to and from the Works Area.

6.8.5. If required, the following ZoIs, taken from IAQM guidance, will be used to assess dust emissions with respect to:

- A human receptor within:
  - 250 m of the boundary of the Proposed Works; or
  - 50 m of the route(s) used by mobile machinery; and
  - mobile machinery on the public highway, up to 250 m from site entrance(s).
- An ecological receptor within:
  - 50 m of the boundary of the Proposed Works; or
  - 50 m of the route(s) used by mobile machinery; and
  - mobile machinery on the public highway, up to 250 m from site entrance(s).

6.8.6. The temporal scope of the assessment is consistent with the period over which the Proposed Works will be carried out (see **Chapter 2: The Decommissioning Process**).

6.8.7. The latest version of the IAQM's dust guidance was published in 2024. The air quality Scoping Report submitted for this application, included the ZoIs as per the previous IAQM's dust guidance. Previously, human receptors would be assessed within 350 m of the boundary of the Proposed Works.

Road traffic emissions

6.8.8. A screening assessment has been undertaken to consider the impacts from road traffic emissions. This screening assessment has considered the preferred construction routing (as per **Chapter 16: Traffic and Transport**) to assess at the impact on human receptors.

6.8.9. When considering the impact on ecological receptors, a distance of 200 m extending from the construction route corridor to any nationally designated sites has been used to identify any ecological receptors that have the potential to be impacted by road traffic emissions associated with the Proposed Works.

Potential receptors

6.8.10. Potential receptors include those which have the potential to be impacted by dust emissions associated with the Proposed Works. The ZoIs reported within the IAQM's updated dust guidance will be used to identify potential human and ecological receptors (as reported within paragraph 6.8.5).

6.8.11. The King Charles III Coast Path is located within the 250 m buffer of the Works Area. Users of this path are not considered to be a receptor sensitive to the Air Quality Objectives as per TG(22) guidance[19]. This is due to the transitory nature of the use of the path. It is therefore considered to be not likely that members of the public would be exposed for the length of the averaging period, as defined by TG(22) guidance[19]. It is however considered a relevant receptor in relation to construction dust, in terms of both amenity and human health, and is considered in the construction dust assessment below.

6.8.12. There are no further human receptors within 250 m of the Proposed Works or within 50 m of the construction routes within 250 m of the Proposed Works. **Figure 6.2** shows the buffer of 250 m around the Proposed Works.

6.8.13. There are potentially sensitive ecological receptor sites within the vicinity of the Proposed Works as presented in **Table 6-18**.

Table 6-18 - Location and description of representative designated ecological receptors

Receptor	Reason for Consideration
Bridgwater Bay SSSI / Somerset Wetlands NNR	Immediately adjacent to Works Area.
Severn Estuary Special Area of Conservation (SAC) / Special Protection Area (SPA) / Ramsar	Immediately adjacent to Works Area.

Likely significant effects

6.8.14. Likely significant air quality effects were proposed at the EIA Scoping stage and have been considered in the ES assessment. These are reported in **Table 6-19**.

Table 6-19 - Likely significant air quality effects

Receptor	Likely significant effects
Human and ecological receptors.	**Construction, demolition, earthworks and trackout activities:** Fugitive dust emissions contributing to loss of amenity and effects on human health/biodiversity areas. Whilst it is typically the case that fugitive dust emissions can be adequately mitigated to ensure no significant effects occur, an assessment of such emissions using the IAQM's dust guidance[20] has been undertaken to define site-specific mitigation.

Effects scoped out of assessment

6.8.15. The effects scoped out of further assessment are:

- On-road HGVs and LDV movements for construction and demolition activities associated with the Proposed Works;
    - Combustion product emissions potentially increasing the baseline concentration of NOx, NO2, PM10 and PM2.5 and associated effects on human health and integrity of biodiversity sites.

6.8.16. The road traffic emissions associated with the Proposed Works include emissions generated from:

- The workforce travelling to and from site during the Preparations for Quiescence phase and Final Site Clearance phase.
- The transportation of construction and deconstruction materials, plant and equipment to and from site to enable both the construction of the Safestore, and the de-planting and deconstruction during the Preparations for Quiescence phase and Final Site Clearance phase.

- The transportation of wastes generated during the de-planting and deconstruction process during the Preparations for Quiescence phase and Final Site Clearance phase.

6.8.17. The road traffic emissions discussed above have been scoped out of further assessment after review of traffic data provided within **Chapter 16: Traffic and Transport** and review of the final design of the Proposed Works. The justification for this position is reported below in paragraphs 6.9.17 to 6.9.21.

6.8.18. **Chapter 16: Traffic and Transport**, assumes that the worst-case traffic flows are expected during the Preparations for Quiescence phase. Therefore, the traffic screening assessment presented in this chapter has considered the maximum vehicle movements anticipated during all three phases of the Proposed Works.

Road traffic emissions during the Preparations for Quiescence phase

Impacts on human receptors

6.8.19. Two different construction routes have been considered within **Chapter 16: Traffic and Transport**. Route 1 (the northern route) has been selected as the preferred route and therefore has been taken forward for consideration within this chapter.

6.8.20. During the Preparations for Quiescence phase, there are road traffic emissions expected from construction traffic needed for the deplanting and deconstruction works, potential void infilling works and for the construction of the Safestore. During deplanting and deconstruction, there are expected to be traffic movements for the transportation off site of the wastes generated.

6.8.21. Annual Average Daily Traffic flows (AADTs) have been estimated for the HDV movements associated with the above traffic movements and are reported in **Table 16-24** of the **Chapter 16: Traffic and Transport**. As per **Chapter 16: Traffic and Transport**, the change in traffic flows have been estimated for the worst-case years expected during the Preparations for Quiescence phase. The worst-case year is therefore identified as 2034.

6.8.22. During 2034, a change in HDV of 30 AADT and a change in LDV of 100 AADT has been predicted as a result of the Proposed Works.

6.8.23. Review of the preferred route shows that construction traffic is not expected to travel through any AQMAs. As per **Table 6-17**, a change in HDV flows of more than 100 AADT and a change in LDV flows of more than 500 AADT outside of an AQMA will screen the need for a detailed assessment of these road traffic emissions. The change in HDV and LDV AADTs predicted as a result of the Proposed Works are below the 100 AADT and 500 AADT thresholds. Therefore, a detailed assessment of road traffic emissions associated with the Proposed Works is not required.

Impacts on ecological receptors

6.8.24. The IAQM guidance on air quality impacts on nature sites[23] outlines that to consider the air quality impacts on nationally designated sites, a screening assessment should screen out air quality emission sources which are too small or too far away from the sites.

6.8.25. Nationally designated sites are reported within **Table 6-18.** Severn Estuary SAC/SPA/Ramsar and Bridgwater Bay SSSI are within 200 m of construction assess route at Wick Moor Drove. The closest point of the Severn Estuary SAC/SPA/Ramsar and Bridgwater Bay SSSI to the construction access route is approximately 5.6 m. The APIS website reports that there are habitats within Severn Estuary

SPA/Ramsar and Bridgwater Bay SSSI which are sensitive to nitrogen deposition. Therefore, as per the IAQM guidance, consideration of the AADT expected from the Proposed Works has been undertaken.

6.8.26. The IAQM guidance on air quality impacts on nature sites[23] suggests the use of 1000 LDV AADT and 200 HDV AADT as a threshold for scoping out the need for a detailed assessment of impacts from road traffic emissions on nationally designated sites. These are thresholds reported within the DMRB technical guidance. The change in LDV flow of 100 AADT for Route 1 and Route 2, predicted as a result of the Proposed Works is below 1,000 AADT, therefore the need to undertake a detailed assessment of the effects from these road traffic emissions has been scoped out from further assessment. The change in HDV of 30 AADT for Route 1 and Route 2 predicted as a result of the Proposed Works is below 200 AADT, therefore the need to undertake a detailed assessment of the effects from these road traffic emissions has been scoped out from further assessment.

6.8.27. Natural England's guidance[27] outlines that a significant effect on nationally designated sites is likely if it is "*likely to undermine the conservation objectives of the site.*" Consideration of the impact to an ecological site's CL is now widely used to further consider the long-term pollution on an ecological site from air quality sources. The Environment Agency report that an increment of 1% or less of the CL is considered inconsequential[34]. Despite the Environment Agency reporting this for permitting considerations, the threshold of 1% or less of the CL is used widely and suggested to be used within the IAQM's guidance on air quality impacts on nature sites to define long term impacts on national designated sites from air quality pollution.

6.8.28. JNCC[26] report that at a distance of 25 m from an affected road:

- A change in traffic flow of 547 AADT is required to cause a change of 1% of the CL for NO_x.
- A change in traffic flow of 731 AADT is required to cause a change of 1% of the CL for Ammonia.

6.8.29. At a distance of 5.6 m from the construction routes, and with a change in HDV of 30 AADT and a change in LDV of 100 AADT expected from the Proposed Works, impacts from these road traffic emissions on the Severn Estuary SAC/SPA/Ramsar and Bridgwater Bay SSSI can be reasonably concluded as **Not Significant**.

6.8.30. In addition, the Site access route (Wick Moor Drove) is at 384 m to the Somerset Wetlands National Nature Reserve. With regards to vehicle emissions, the Proposed Works are predicted to have an effect on the conservation status of this NNR site that is of **Very Low** magnitude and **Not Significant**.

[34] Environment Agency (2016). Air emissions risk assessment for your environmental permit. (Online). Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit (Accessed August 2024).

6.9 Assessment of effects

6.9.1. The ZoIs outlined in paragraph 6.8.5 (as per the IAQM's dust guidance) have been used to determine whether an assessment of dust emission effects is required.

6.9.2. There are ecological receptors found within 50 m of the Works Area. A qualitative desk-based assessment of the effects of dust emissions derived as a result of the Proposed Works is therefore required. The qualitative desk-based assessment considers the effects of dust emissions associated with the Preparations for Quiescence phase and Final Site Clearance as these are considered the worst-case phases of the Proposed Works, with the most overlap of activities that have the potential to give rise to dust emissions.

Assessment of potential dust emission magnitude

6.9.3. The IAQM assessment methodology[20] has been used to determine the potential dust emission magnitude for the following four different dust and Particulate Matter (PM) sources: demolition; earthworks; construction and trackout. The findings of the assessment are presented below in paragraphs 6.9.5 to 6.9.9.

6.9.4. As per **Table 6B.1** within **Appendix 6B**, the dust emission magnitudes have been concluded by estimating the type of dust emission and the quantity of this dust emission. This is in line with the IAQM guidance, which provides examples of dust emission magnitudes relating to a range of dust generating activities.

Demolition

6.9.5. During the Preparations for Quiescence phase existing buildings in the Works Area will be demolished. The waste expected from this activity has been estimated to be more than 75,000 m^3 of material, therefore the potential dust emission magnitude is classed as 'Large' for demolition activities.

Earthworks

6.9.6. Of the existing buildings to be demolished, there are some which contain basements therefore the demolition of these buildings will create voids. Part of the rubble collected from demolition works will be used to fill in these voids. The total floor area of voids to be filled have been estimated. A maximum basement depth of 8 m has been assumed for this assessment. The total volume of voids created by the Proposed Works is approximately 77,000 m^3, assuming a maximum depth of 8 m, there is an estimated exposed surface area of voids, of approximately 10,000 m^2. Therefore, the potential dust emission magnitude is classed as 'Small' for earthwork activities, as the area is less than 18,000 m^2.

Construction

6.9.7. Construction works during the Preparations for Quiescence phase includes the cladding around the reactor building to create the Safestore. The works will primarily involve removing existing cladding and glass and fitting of new aluminium cladding. Cranes will be used to assist with removal and replacement of structural elements of the building. Therefore, the potential dust emission magnitude is classed as 'Medium' for construction works.

Trackout

6.9.8. As per Paragraph 6.8.22, AADT two-way HDV flows have been estimated for the Proposed Works, also recognising that vehicles within the Site and Works Area will continue to use existing roads, with only limited transit across unmade ground. The Proposed Works will generate less than 20 outward (one-way) HDV movements in any one day. The potential dust emission magnitude for trackout is therefore classed as 'Small'.

6.9.9. **Table 6-20** provides a summary of the potential dust emission magnitude determined for activities involved in the Proposed Works.

Table 6-20 - Construction dust emission magnitude

Source	Dust emission magnitude
Demolition	Large
Earthworks	Small
Construction	Medium
Trackout	Small

Assessment of sensitivity of the Study Area

6.9.10. As discussed in **Section 6.7,** the IAQM guidance[20] considers three separate dust impacts and advises that the sensitivity of the area in the vicinity of the Proposed Works towards each dust impact is assessed. This section defines the sensitivity of the area in the vicinity of the Proposed Works in respect to the following three dust impacts:

- Dust soiling;
- human health; and
- ecological impacts.

6.9.11. According to the IAQM guidance[20] (see **Appendix 6B**) residential properties and schools would be '*high sensitivity*' receptors for both dust and particulate matter. Places of work (which includes retail uses) would be classed as 'medium sensitivity' receptors, and locations with transient exposure or where users would not expect a reasonable level of amenity (i.e. locations with already elevated dust deposition levels) would be classed as 'low sensitivity' receptors (for example, playing fields, footpaths, short-term car parks etc).

6.9.12. There are no high sensitivity human receptors within 250m of the Works Area. Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected to exposure of PM_{10}. However, people in the workplace are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason, workplaces are typically considered medium sensitivity receptors. However, it is considered that workers within the HPA decommissioning workforce are subject to the same dust workforce mitigation as those required as part of the Proposed Works. Workers occupational exposure to PM_{10} is not covered in the assessment as protection is covered by Health and Safety at Work legislation.

6.9.13. The King Charles III Coast Path is due to be reinstated shortly after the start of generation at HPC. This can be considered a low sensitivity receptor to dust soiling and human health.

Ecological

6.9.14. According to the IAQM guidance, an ecological site with SAC designation is a 'high' sensitive receptor (see **Table 6B.6**). There is a SAC within 20 m of the Proposed Works. Therefore, according to the matrix reported in **Table 6B.7,** the sensitivity of the surrounding area towards ecological impacts from demolition, earthworks, construction and trackout activities is classed as 'high'.

6.9.15. **Table 6-21** summarises the conclusions of sensitivity of the Study Area.

Table 6-21 - Summary of the sensitivity of the Study Area in relation to all four activities

Potential impact	Sensitivity of the surrounding area			
	Demolition	Earthworks	Construction	Trackout
Ecological	High	High	High	High
Human Health	Low	Negligible	Negligible	Negligible
Dust Soiling	Low	Negligible	Negligible	Negligible

Risk of impacts

6.9.16. IAQM guidance[20] provides a matrix which combines the sensitivity of the area (**Table 6-21**), and the dust emission magnitude (**Table 6-20**). The combination of the two provides an indication of the risk that a dust impact will occur for each activity in the absence of mitigation measures.

6.9.17. The results show that, if no mitigation measures are put in place, the risk of dust impacts is 'High' for demolition and 'Low' from construction, earthworks and trackout activities. The risk of dust impacts has been concluded by following the matrix reported within the IAQM guidance[20] (**Table 6B.5** within **Appendix 6B**)

6.9.18. The results are summarised in **Table 6-22** below.

Table 6-22 - Final results defining the risk of impact of each activity

Potential impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Ecological	High	Low	Medium	Low
Human Health	Low	Low	Low	Low
Dust Soiling	Low	Low	Low	Low

Management measures

6.9.19. The management measures shown in **Table 6-23** are highly recommended by the IAQM for a 'high risk' site that will ensure potential dust effects are negligible.

Table 6-23 - Summary of mitigation measures

Category	Measures to be incorporated across the Proposed Works
Communication	Stakeholder communication and management will be managed through existing arrangement e.g. Site Stakeholder Group (SSG).
Site management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Record any exceptional incidents that cause dust and/or emissions, either on- or off-site and the action taken to resolve the situation. Hold liaison meetings with other high risk construction sites within 250 m of the site boundary.
Monitoring	Carry out appropriate site inspections to monitor compliance with the DMP, record inspection results, and make an inspection records available to the relevant authority when asked. Increase the frequency of site inspections by the person accountable for air quality and dust issues on-site, when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions. Undertake on-site and off-site inspections around high potential activities, where receptors (including roads) are nearby, to monitor dust. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of site boundary, with cleaning to be provided if necessary. Identify appropriate dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations. Where appropriate, commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences.
Preparing and maintaining site	Preparing and maintaining site layout so that machinery and dust causing activities are located away from receptors, as far as possible.. Erect solid screens or barriers around dusty as appropriate in consideration with the height of stockpiles on site. Where possible, fully enclose specific operations where there is a high potential for dust production and the area is active for an extensive period. Avoid site runoff of water or mud. Keep hoarding, barriers and scaffolding clean using wet methods. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. Where appropriate, cover, seed or fence stockpiles to prevent wind whipping.

Category	Measures to be incorporated across the Proposed Works
Operating vehicles/ machinery	Ensure all vehicles switch off engines when stationary and not operating – no idling vehicles. Impose and signpost a suitable maximum-speed-limit on surfaced and un-surfaced haul roads and work areas. Avoid the use of diesel- or petrol-powered generators and use low-carbon alternative equipment where practicable. Produce a Construction Logistics Plan that supports and encourages sustainable travel. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Operations	Where possible, only use cutting, grinding or sawing equipment fitted, or in conjunction, with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems. Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips where practicable. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment, wherever appropriate. Ensure equipment readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event, using wet cleaning methods.
Waste management	Avoid burning of waste materials.
Demolition	Soft strip inside buildings before demolition. Ensure effective water suppression is used during demolition operations. Avoid explosive blasting, using appropriate manual or mechanical alternatives. Bag and remove any biological debris or damp down such material before demolition.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. Stockpiles of topsoil which remain present for six months or longer will be used (e.g. through seeding) to encourage stabilisation, minimise soil erosion and prevent infestation by nuisance weeds. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. This will depend on conditions and season. Only remove the cover in small areas during work and not all at once.

Category	Measures to be incorporated across the Proposed Works
Construction	Avoid scabbling if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
Trackout	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the Site. This may require the sweeper being continuously in use. At compound and access points, wheel wash or dust sweepers will be used. Avoid dry sweeping of large areas, where possible. Refer to the Dust Management Plan. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. Record all inspections of haul routes and any subsequent action in a site log book. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the Site where reasonably practicable). Where possible, ensure there is an adequate area of hard surfaced road between the wheel wash facility and the Site exit, wherever site size and layout permits. Access gates to be located at least 10 m from receptors where possible. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned during activities with a high potential for creating dust.

6.10 Assessment of cumulative effects

Inter-Project effects

6.10.1. There is the potential for air quality effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

6.10.2. An assessment inter-project effects is considered within in **Chapter: 21: Cumulative Effects Assessment** of this ES.

Intra-Project effects

6.10.3. There is the potential for intra-project effects on amenity and ecology as a result of air quality impacts. An assessment of intra-project effects is provided in **Chapter 21: Cumulative Effects** Assessment, as well as considered within the following environmental aspect chapters: **Chapters 8: Terrestrial Biodiversity and Ornithology** and **Chapter 17: People and Communities** of this ES.

6.11 Summary

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
Ecological	Fugitive dust emissions contributing to loss of amenity and effects on biodiversity areas.	High sensitivity	High risk from demolition activities associated with the Proposed Works. Low risk from construction, earthworks and trackout activities associated with the Proposed Works.	Not Significant	The risk of effects has been concluded without consideration of the application of mitigation measures. With the embedded measures reported within applied, the risk of impact from fugitive dust emissions will be not significant. As per the IAQM guidance reports that significant effects on receptors are prevented through the application of effective mitigation. Furthermore, this concludes that the residual effect is 'not significant'
Human Health	Users of the King Charles III Coast Path	Low sensitivity	Low risk from demolition activities associated with the Proposed Works. Negligible risk from construction, earthworks and trackout activities associated with the Proposed Works.	Not Significant	

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7

Climate change

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7 Climate change

7.1 Introduction

7.1.1. This chapter assesses the potential effects with respect to climate change, specifically in relation to greenhouse gas (GHG) emissions arising from the Indicative Dismantling Works Area (hereafter referred to as 'the Works Area') and from road traffic related to the Proposed Works. This chapter should be read in conjunction with the project description provided in **Chapter 2: The Decommissioning Process**.

7.1.2. The 2018 amendment to the Environment Impact Assessment (EIA) for Decommissioning Regulations[1] (hereafter referred to as EIADR) requires consideration of the impact of the Proposed Works on climate (for example the nature and magnitude of GHG emissions) and the vulnerability of the Proposed Works to climate change (climate change resilience (CCR)).

7.1.3. The aim of the GHG assessment is to determine the GHG emissions arising from the Proposed Works. These calculations are used to inform assessment of the extent to which the Proposed Works would affect the ability to achieve national, regional and local targets for decarbonisation.

7.1.4. For Climate Change Resilience, a quantitative projection of future climate conditions at the Hinkley Point B Nuclear Site Licence Boundary (the 'Site'), based on the UK Climate Change Projections 2018 (UKCP18), is presented as in **Appendix 7B**). The measures to ensure Climate Change Resilience of the Proposed Works are reported in relevant aspect chapters of the ES (**Chapter 6: Air Quality; Chapter 11: Surface Water and Flood Risk**; and **Chapter 12: Soils, Geology and Hydrogeology**). They are summarised within this climate change chapter (see **Section 7.13**).

7.1.5. The in-combination climate change impact (ICCI) assessment, which considers the extent to which climate change exacerbates effects on receptors identified in the other aspect chapters, including the efficacy of any mitigation, is described in relevant aspect chapters of the ES.

7.1.6. This chapter is supported by the following appendices provided in Volume III of this ES:

- Appendix 7A: Data Sources;
- Appendix 7B: Climate Change Baseline; and
- Appendix 7C: Climate Change Resilience of the Proposed Works.

[1] UK Government (2018). The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018 (online). Available at: The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018 (legislation.gov.uk) (Accessed 26 August 2024).

7.2 Relevant legislation, policy and technical guidance

Legislation

7.2.1. The legislation presented in **Table 7-1** is relevant to the GHG assessment.

Table 7-1 - Legislation relevant to GHG emissions

Legislation	Legislation issue
Climate Change Act 20082 (including The Climate Change Act 2008 (2050 Target Amendment) Order 20193)	This Act, as amended in 2019, commits the UK to reduce its net GHG emissions by at least 100% below 1990 levels by 2050 (the 'UK carbon target', often referred to as 'net zero') and requires the Government to establish 5-year carbon budgets. The Climate Change Act 2008 also established an independent expert body, the Climate Change Committee (CCC), to advise the Government on the level of those emissions targets and report on progress made to reduce emissions.
The Carbon Budgets Order 2009[4]	This legislation implements the carbon budgets set out in the Climate Change Act 2008[2]. The budgets require the UK to continually reduce emissions in line with the carbon reduction commitments established under that Act. The carbon budgets are: ▪ first carbon budget, 2008 to 2012, 3,018 mega tonnes carbon dioxide equivalent ($MtCO_2e$) representing 25% reduction below 1990 levels; ▪ second carbon budget, 2013 to 2017, 2,782 $MtCO_2e$ representing 31% reduction below 1990 levels; ▪ third carbon budget, 2018 to 2022, 2,544 $MtCO_2e$ representing 37% reduction below 1990 levels by 2020; ▪ fourth carbon budget, 2023 to 2027, 1,950 $MtCO_2e$ representing 51% reduction below 1990 levels by 2025;[5] ▪ fifth carbon budget, 2028 to 2032, 1,725 $MtCO_2e$ representing 57% reduction below 1990 levels by 2030;[6] and ▪ sixth carbon budget, 2033 to 2037, 965 $MtCO_2e$ representing 78% reduction below 1990 levels by 2035.[7]

[2] UK Government (2008). Climate Change Act 2008 (online). Available at: https://www.legislation.gov.uk/ukpga/2008/27/contents (Accessed August 2024).
[3] UK Government (2008). The Climate Change Act 2008 (2050 Target Amendment) Order 2019 (online). Available at: https://www.legislation.gov.uk/uksi/2019/1056/contents/made (Accessed August 2024).
[4] UK Government (2009). The Carbon Budgets Order 2009 (online). Available at: https://www.legislation.gov.uk/uksi/2009/1259/contents/made (Accessed August 2024).
[5] UK Government (2011). The Carbon Budget Order 2011 (online). Available at: https://www.legislation.gov.uk/uksi/2011/1603/contents/made (Accessed August 2024).
[6] UK Government (2016). The Carbon Budget Order 2016 (online). Available at: https://www.legislation.gov.uk/uksi/2016/785/contents/made (Accessed August 2024).
[7] UK Government (2021). The Carbon Budget Order 2021 (online). Available at: https://www.legislation.gov.uk/uksi/2021/750/contents/made (Accessed August 2024).

Policy

7.2.2. A summary of the relevant policies is given in **Table 7-2**.

Table 7-2 - Policy relevant to climate change

Policy reference	Policy relevance
International Policy	
The United Nations Framework Convention on Climate Change (UNFCCC) Paris Agreement[8]	The UNFCCC is the major international body responsible for managing climate change and carbon emissions. In 2015, it adopted the Paris Agreement, the aims of which are stated as: "*This Agreement, in enhancing the implementation of the Convention, including its objective, aims to strengthen the global response to the threat of climate change, in the context of sustainable development and efforts to eradicate poverty, including by: (a) Holding the increase in the global average temperature to well below 2 °C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5 °C above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change*". The agreement sets targets for countries' GHG emissions; the targets are not legally binding or enforceable.
UNFCCC Kyoto Protocol[9]	The Kyoto Protocol was adopted in December 1997. It commits industrialised countries and economies to transition to limit and reduce GHG emissions in accordance with agreed individual targets. These have been strengthened in more recent international agreements culminating in the Paris Agreement, as described above. It covers six categories of GHG: carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphurhexafluoride (SF6). In this GHG assessment, these six GHG are collectively considered "GHG emissions" and reported as carbon dioxide equivalent (CO2e) GHG emissions.
UNFCCC Glasgow Climate Pact[10]	The recent Conference of the Parties (COP 26) resulted in almost 200 countries agreeing on: the acceleration of action on climate change this decade to reduce emissions (mitigation); helping those already impacted by climate change (adaption); enabling countries to deliver on their climate goals (finance); and working together to deliver even greater action (collaboration). This agreement is in the form of the Glasgow Climate Pact which reaffirms the long-term goal to limit global warming to 1.5°C above pre-industrial levels and resolves to pursue efforts to achieve this, recognising that limiting global warming to 1.5°C "requires rapid, deep and sustained reductions in global greenhouse gas emissions,

[8] UNFCC (2015). Paris Agreement (online). Available at: https://unfccc.int/sites/default/files/english_paris_agreement.pdf (Accessed August 2024).

[9] UNFCC (1998). Kyoto Protocol (online). Available at: https://unfccc.int/resource/docs/convkp/kpeng.pdf (Accessed August 2024).

[10] UNFCC (2021). Glasgow Climate Pact (online). Available at: https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf (Accessed August 2024).

Policy reference	Policy relevance
	including reducing global CO2 emissions by 45% by 2030 relative to the 2010 level and to net zero around mid-century, as well as deep reductions in other greenhouse gases".
National Policies	
National Planning Policy Framework (NPPF)[11]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it provides information in relation to achieving sustainable development and relevant for the assessment of the Proposed Works. Paragraph 157 states: "*The planning system should support the transition to a low carbon future in a changing climate… shape places in ways that contribute to radical reductions in greenhouse gas emissions… and support renewable and low carbon energy and associated infrastructure*". It also requires in paragraph 159 (b) that new development should be planned for in ways that "*can help to reduce greenhouse gas emissions, such as through its location, orientation and design*." Furthermore, it is stated in paragraph 162, that local planning authorities should expect new developments to: a) "*comply with any development plan policies on local requirements for decentralised energy supply unless it can be demonstrated by the applicant, having regard to the type of development involved and its design, that this is not feasible or viable; and* *b) take account of landform, layout, building orientation, massing and landscaping to minimise energy consumption*."
The UK's Nationally Determined Contribution (NDC) under the Paris Agreement[12]	In December 2020, the UK submitted its first NDC under the Paris Agreement[8], committing to *"at least a 68%"* reduction in economy-wide GHG emissions below 1990 levels (1995 levels for F-gases) by 2030, aligned with the UK's 2050 net zero GHG emissions target.

11 Department for Levelling Up, Housing & Communities (2023). National Planning Policy Framework (online). Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf (Accessed August 2024).

12 Department for Business, Energy & Industrial Strategy (2020). The UK's Nationally Determined Contribution under the Paris Agreement (online). Available at: https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc (Accessed August 2024).

Policy reference	Policy relevance
Clean Growth Strategy[13]	Provides the strategy for the UK's future clean growth to allow carbon budgets to be met and support economic growth. It sets out policies and targets out to 2050 for reducing GHG emissions across a number of sectors.
The Ten Point Plan for a Green Industrial Revolution[14]	Sets out the UK Government's approach to "*build back better*" following the impacts of the COVID-19 pandemic. It includes details of how the Government intend to accelerate the path to net zero.
Net Zero Strategy: Build Back Greener[15]	This strategy sets out sectoral policies and proposals for decarbonising all sectors of the UK economy to meet the coming carbon budgets, the NDC and the net zero target by 2050. It aims to enable the delivery of the objectives set out in the Ten Point Plan[14].
Net Zero – The UK's contribution to stopping global warming[16]	This report prepared by the CCC to the UK Government reassesses the UK's long-term emission target. In the UK, the report recommends a net zero date of 2050 achieved through known technologies, improvements in people's lives and policy updates. As a result of this report, emission targets in the UK were updated in the Climate Change Act 2008.[3]
European Union (EU) Emissions Trading Scheme (ETS)[17]	The EU ETS is a cap-and-trade mechanism in which an allowance for annual carbon emissions from various sectors have been agreed at the EU level. Nuclear generation has a free allowance under the EU ETS.
The NDA Group Sustainability Strategy[18]	Sets out the NDA group's five-year strategy to deliver safe, secure and sustainable nuclear clean-up and waste management.
Local Policies	
Somerset West and Taunton Local Plan 2040 Issues and	This consultation document sets out the Council's Corporate Strategy of high-level priorities for the Council. This includes creating "*a low-carbon,*

13 Department for Business, Energy and Industrial Strategy (2017) Clean Growth Strategy (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/700496/clean-growth-strategy-correction-april-2018.pdf (Accessed August 2024).

14 HM Government (2020). The Ten Point Plan for a Green Industrial Revolution (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/936567/10_POINT_PLAN_BOOKLET.pdf (Accessed August 2024).

15 Department for Business, Energy & Industrial Strategy (2021). Net Zero Strategy: Build Back Greener (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf (Accessed August 2024).

16 CCC (2019). Net Zero – The UK's contribution to stopping global warming (online). Available at: https://www.theccc.org.uk/wp-content/uploads/2019/05/Net-Zero-The-UKs-contribution-to-stopping-global-warming.pdf (Accessed August 2024).

17 European Parliament and the Council of the European Union (2003). Establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (the EU Emissions Trading System) (online). Available at: http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32003L0087&from=EN (Accessed August 2024).

18 Nuclear Decommissioning Authority (2022), The NDA Group Sustainability Strategy: 2022 (online) https://www.gov.uk/government/publications/the-nda-group-sustainability-strategy-2022 (Accessed August 2024)

Policy reference	Policy relevance
Options Document (consultation document) (2020)[19]	*clean, green and prosperous district*". Objective 1 of the Issues and Options Document details the commitment to ensure that new development contributes to the achievement of "*carbon neutrality by 2030*" in the District. In order to meet this objective a number of policy approaches are proposed including integration of sustainable design into new development, retrofitting existing buildings and maximising recycling. As stated in **Chapter 4: Policy and Legislation Overview**, Somerset West and Taunton Council (SWT) are no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council.
Adopted West Somerset Local Plan to 2032 (2016)[20]	The adopted West Somerset Local Plan includes West Somerset's vision for the next 10 years, encouraging the creation of low/zero carbon economy and the use of low energy solutions in new developments. Relevant policies include: ▪ Policy CC1: Carbon reduction non-wind energy generating schemes – aimed at ensuring appropriate mitigation of adverse impacts; ▪ Policy NH13: Securing high standards of design – including measures to minimise carbon emissions and promote renewable energy; and ▪ Policy SD1: Presumption in favour of sustainable development.
Somerset Adopted Waste Core Strategy Development Plan Document up to 2028 (2013)[21]	The Waste Core Strategy Development Plan Document guides Somerset County Council's (SCC) approach to planning for sustainable waste management until 2028. One objective of this plan (Objective J) is to "*reduce carbon emissions from waste management and encourage development that helps to mitigate the causes of climate change and adapt to its effects*".
Somerset West and Taunton Carbon Neutrality and Climate Resilience	In February 2019, SWT declared a climate emergency and committed to working towards making the Council and the area as a whole carbon neutral by 2030. Actions include expansion of renewable energy,

[19] Somerset West and Taunton Council (2020). Somerset West and Taunton Local Plan 2040 Issues and Options Document (online). Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Planning%20and%20Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSomerset%20West%20and%20Taunton%20Local%20Plan%202040%20Review%2Fissues%20and%20options%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSomerset%20West%20and%20Taunton%20Local%20Plan%202040%20Review&p=true&ga=1 (Accessed August 2024)

[20] West Somerset Council (2016). Adopted West Somerset Local Plan to 2032 (online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (August 2024)

[21] Somerset County Council (2013). Waste Core Strategy Development Plan Document up to 2028. (online) Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Waste/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FWaste%2FSomerset%20Waste%20Core%20Strategy%2Epdf&parent=%2Fsites%2FSCCPublic%2FWaste&p=true&ga=1 (August 2024)

Policy reference	Policy relevance
Action Plan 2020 (2020)[22]	expansion of electric vehicles and active travel, the growth of a carbon neutral economy, and expansion of green and blue infrastructure. This Action Plan sits alongside the county-wide Somerset Climate Emergency Strategy.
Towards a Climate Resilient Somerset: Somerset's Climate Emergency Strategy (2020)[23]	This document is a response to the climate emergency declarations of the five Local Authorities in Somerset. The Strategy is supported by individual Local Authority Action Plans that specifically identify how the overall Strategy is relevant to each district. It sets out a strategy shared by the local authorities, built around three goals: ▪ *"Goal 1: To decarbonise Local Authorities, the wider public sector estates and reduce our carbon footprint;* ▪ *Goal 2: To work towards making Somerset a Carbon Neutral County by 2030; and* ▪ *Goal 3: To have a Somerset which is prepared for, and resilient to, the impacts of Climate Change."*

Technical guidance

7.2.3. A summary of the relevant technical guidance for the GHG emissions assessment is given in **Table 7-3.**

Table 7-3 - Technical guidance relevant to climate change

Technical guidance	Context
Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition[24]	Provides guidance on GHG emissions assessment, mitigation and reporting within an EIA context. This is the primary source of guidance for assessing GHG emissions. The 2022 guidance further builds upon the 2017 guidance, with key changes including an emphasis on mitigation at the project outset and throughout its duration, and more nuanced levels of GHG emissions significance. It provides detail on the application of the five Institute of Environmental Management and Assessment (IEMA) Principles on Climate Change Mitigation and EIA[25]:

[22] Somerset West and Taunton Council (2020). Carbon Neutrality and Climate Resilience Action Plan (online). Available at: https://democracy.somerset.gov.uk/Data/SWT%20Full%20Council/202010261815/Agenda/Appendix%20B%20-%20CNCR%20Final%20for%20Publication.pdf (August 2024).

[23] Somerset County Council (2020) Towards a Climate Resilient Somerset: Climate Resilient Somerset – Somerset's Climate Emergency Strategy (online). Available at: https://democracy.somerset.gov.uk/Data/SWT%20Full%20Council/202010261815/Agenda/Appendix%20A%20-%20Somerset%20Climate%20Emergency%20Strategy%20Final%20Oct%202020.pdf (August 2024).

[24] IEMA (2022). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition (online). Available at: https://www.iema.net/resources/blog/2022/02/24/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions (Accessed August 2024).

[25] IEMA (2010). IEMA Principles Series: Climate Change Mitigation & EIA. (online) Available at: https://www.iema.net/document-download/33006#:~:text=IEMA%20Principles%20Series%3A&text=Reducing%20greenhouse%20gas%20(GHG)%20emissions,related%20when%20planning%20future%20actions. (Accessed August 2024).

Technical guidance	Context
	1. *"The GHG emissions from all projects will contribute to climate change, the largest inter-related cumulative environmental effect.* 2. *The consequences of a changing climate have the potential to lead to significant environmental effects on all topics in the EIA Directive (e.g. human health, biodiversity, water, land use, air quality).* 3. *The UK has legally binding GHG reduction targets – EIA must therefore give due consideration to how a project will contribute to the achievement of these targets.* 4. *GHG emissions have a combined environmental effect that is approaching a scientifically defined environmental limit, as such any GHG emissions or reductions from a project might be considered to be significant.* 5. *The EIA process should, at an early stage, influence the location and design of projects to optimise GHG performance and limit likely contribution to GHG emissions."*
Methodology to calculate embodied carbon 1st edition[26]	The guidance note represents best practice on how to estimate carbon emissions associated with product and construction process stages. The aim of the guidance is to provide a framework of practical guidance on how to calculate embodied carbon emissions associated with projects.
Publicly Available Standard (PAS) 2080: 2023 – Carbon management in infrastructure and built environment[27]	Provides an approach to reducing GHG emissions from infrastructure projects including working with stakeholders throughout a project.
The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (GHG Protocol)[28]	Provides standards and guidance for preparing a GHG emissions inventory. It covers the accounting and reporting of the six GHGs covered by the Kyoto Protocol[9].
BS EN ISO 14064-1[29] and 14064-2[30]	Sets out guidance for quantification and reporting of GHG emissions and removals. The methodology presented in this chapter for the quantification of GHGs follows this guidance and the stated guidance on reporting will be taken into account as part of this assessment.

[26] RICS (2012). to calculate Methodology embodied carbon 1st edition (online). Available at: https://www.igbc.ie/wp-content/uploads/2015/02/RICS-Methodology_embodied_carbon_materials_final-1st-edition.pdf (Accessed August 2024).
[27] BSI (2023). PAS 2080: 2023 – Carbon management in infrastructure and built environment (online). Available at: PAS 2080:2023 Carbon Management in Infrastructure | BSI (bsigroup.com) (Accessed August 2024).
[28] World Resources Institute and World Business Council for Sustainable Development (2015). The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition) (online). Available at: https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf (Accessed August 2024).
[29] BSI (2019). BS EN ISO 14064-1: 2019 Greenhouse gases. Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals (online). Available at: https://shop.bsigroup.com/ProductDetail?pid=000000000030327038 (Accessed August 2024).
[30] BSI (2019). BS EN ISO 14064-1: 2019 Greenhouse gases. Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements (online). Available at: https://shop.bsigroup.com/products/greenhouse-gases-specification-with-guidance-at-the-project-level-for-quantification-monitoring-and-reporting-of-greenhouse-gas-emission-reductions-or-removal-enhancements/tracked-changes (Accessed 21 August 2024).

Technical guidance	Context
Intergovernmental Panel on Climate Change (IPCC) Sixth Assessment Report (AR6): Climate Change 2021 - The Physical Science Basis[31]	The publication reinforces the evidence presented in the previous IPCC report (AR5) and, through the utilisation of updated climate model simulations and analyses, states that "*it is unequivocal that human influence has warmed the atmosphere, ocean and land*". It is highlighted that "*global warming of 1.5°C and 2°C will be exceeded during the 21st century unless deep reductions in CO_2 and other greenhouse gas emissions occur in the coming decades*". The publication states that "*limiting human-induced global warming to a specific level requires limiting cumulative CO_2 emissions, reaching at least net zero CO_2 emissions, along with strong reductions in other greenhouse gas emissions*" and it is this assertion which will underpin the international response to global warming. These factors are used to contextualise the GHG emissions created by the Proposed Works.
IPCC AR6: Climate Change 2022 – Mitigation of Climate Change[32]	Provides an updated global assessment of climate change mitigation progress and pledges and also examines the sources of global emissions. It explains developments in emission reduction and mitigation efforts, assessing the impact of national climate pledges in relation to long-term emissions goals.
The Sixth Carbon Budget Electricity Generation[33]	This document contains a summary of content for the electricity generation sector from the CCC's Sixth Carbon Budget Advice. The CCC's recommended carbon budget sector allocations[34] for electricity generation are: ▪ fourth carbon budget, 2023 to 2027, 189 $MtCO_2e$; ▪ fifth carbon budget, 2028 to 2032, 93 $MtCO_2e$; and ▪ sixth carbon budget, 2033 to 2037, 36 $MtCO_2e$. These allocations are used to contextualise emissions from the Proposed Works.

[31] IPCC (2021). The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (Masson-Delmotte, V., P. Zhai, A. Pirani, S. L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M. I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T. K. Maycock, T. Waterfield, O. Yelekçi, R. Yu and B. Zhou (eds.)). Cambridge University Press (online). Available at: https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf (Accessed August 2024).

[32] IPCC (2022). Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change (P.R. Shukla, J. Skea, R. Slade, A. Al Khourdajie, R. van Diemen, D. McCollum, M. Pathak, S. Some, P. Vyas, R. Fradera, M. Belkacemi, A. Hasija, G. Lisboa, S. Luz, J. Malley, (eds.)). Cambridge University Press. (online). Available at: https://www.ipcc.ch/report/ar6/wg3/ (August 2024)

[33] Climate Change Committee (2020) The Sixth Carbon Budget Electricity generation (online) https://www.theccc.org.uk/wp-content/uploads/2020/12/Sector-summary-Electricity-generation.pdf (Accessed August 2024)

[34] Climate Change Committee (2021). The Sixth Carbon Budget: Dataset (V2) (online). Available at: https://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-Dataset_v2.xlsx (Accessed August 2024).

7.3 Data gathering methodology

Desk study

7.3.1. The UK carbon budgets and the CCC's recommended sector allocations have been used to establish the assessment baseline. No other data sources have been gathered to inform the baseline for the GHG emissions assessment. Data sources that have been used for the GHG assessment for the ES delivery stage are discussed in **Appendix 7A**.

Survey work

7.3.2. No survey work has been undertaken in the completion of this ES Chapter.

Data limitations

7.3.3. Assumptions have been made to characterise the likely activities associated with the Proposed Works and therefore enable GHG emissions to be determined. These assumptions ensure a proportionate assessment has been carried out. They are detailed in **Section 7.8: Assumptions and Limitations.**

7.4 Consultation

Pre-application Opinion

7.4.1. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the climate change assessment and confirmation of how these are addressed by the assessment is included in **Table 7-4**.

Table 7-4 - Summary of Pre-application Opinion Responses from ONR

Paragraph Ref	Consideration	How addressed in the ES
17	ONR: In the Climate Change Chapter of the scoping report (chapter 6), although it is recognised that the scope of the EIA should include consideration of the vulnerability of the project to climate change (also known as climate change resilience), climate change resilience is not considered further in this chapter. The scoping report states that "*a semi-quantitative projection of future climate conditions at the site based on the UK Climate Change Projections 2018 will be presented as an appendix to the climate change chapter in the ES*", however, information on how this data will be used in the EIA to determine significant effects has not been	The design process and site safety case are the appropriate mechanisms for ensuring resilience of the Proposed Works to climate change. Therefore, as noted in Chapter 6 of the Scoping Report, a semi-quantitative projection of future climate conditions at the Site based on the UK Climate Change Projections 2018 (UKCP18) is presented in **Appendix 7B**. The measures to ensure climate change resilience of the Proposed Works are reported in other relevant topic chapters of the ES and/or other design detail supplied with the application for decommissioning consent. They are summarised within the climate change chapter of the ES under the sub-heading "*Climate change resilience*".

Paragraph Ref	Consideration	How addressed in the ES
	provided in the scoping report. This should be clarified in the ES.	**Appendix 7C** also presents the consideration of the resilience of the Proposed Works to climate change.

Non-statutory consultation

7.4.2. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

7.4.3. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

7.4.4. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. No comments relevant to the climate change assessment were received.

Technical engagement

7.4.5. No technical engagement has been undertaken in relation to the climate change assessment.

7.5 Overall baseline

Current baseline

7.5.1. The fourth UK carbon budget[5] (2023 to 2027) of 1,950 $MtCO_2e$ can be considered as the current baseline for the GHG emissions assessment (see **Table 7-1**). The 2023 CCC sector allocations for electricity generation are 44.0 $MtCO_2e$ under the UK carbon budget.

7.5.2. The change in GHG emissions associated with the Proposed Works has been evaluated against national, regional and local targets for decarbonisation. The activities involved in the Preparation for Quiescence phase, which are planned to commence in 2024, will occur during the fourth (2023-2027), fifth (2028-2032) and sixth (2033-2037) UK Carbon Budget periods. It is therefore these carbon budgets which are used to contextualise the emissions from this phase.

7.5.3. Given that the change in emissions will be evaluated against these targets, an assessment of the change in GHG emissions arising from current site use in comparison to the Proposed Works is not required.

Future baseline

7.5.4. GHG emissions are expected, and required, to reduce in the future. The UK Government has set a net zero target which requires the UK to reduce GHG emissions by 100% below 1990 levels by 2050[3]. Policy has been implemented at national, regional and local scales in order to achieve targets for decarbonisation (see **Table 7-1** and **Table 7-2**). The future baseline considers a number of the UK carbon budgets (including sectoral allocations), over the duration of the Proposed Works (see **Table 7-3**).

7.5.5. Emissions from a 'without decommissioning' case in the future baseline will not be quantified in this assessment as the decommissioning of Hinkley Point B Power Station (HPB) is required by UK Government policy on the decommissioning of nuclear facilities and under the conditions of the Nuclear Site Licence for HPB.

7.6 Embedded environmental and good practice measures

7.6.1. Environmental measures have been embedded into the Proposed Works and **Table 7-5** outlines how these will influence the climate assessment.

Table 7-5 - Summary of embedded environmental and good practice measures

Embedded measure	Compliance mechanism	Embedded or good practice measure
Fuel and energy consumption: Energy efficient and well-maintained plant equipment should be used. As should mains electricity, if available, rather than diesel-fuelled portable generators. A new electrical overlay will ensure suitable power supplies to the site via a new grid connection and on-site distribution, reducing reliance on diesel generators. This will reduce GHG emissions from fuel and energy consumption.	Environmental Management Plan (EMP)	Embedded measure
There are GHG emissions from deconstruction and construction traffic. Deliveries and the transportation of waste will be consolidated where possible and there should be 'no idling' vehicles. Sustainable modes of travel for the construction workforce will be encouraged. This will reduce GHG emissions from construction traffic	EMP	Good practice
Embodied Carbon: There are embodied GHG emissions associated with the raw materials used to construct the Safestore. Where possible, choice of local sourcing of construction materials should be encouraged. Circular economy principles will be considered and deployed where possible. Carbon measuring and reporting would be undertaken.	EMP	Embedded measure
Due to the length of the Proposed Works, periodic reviews will be undertaken to identify opportunities for GHG emissions reduction and enable the introduction of carbon reducing measures at relevant stages in the decommissioning process. These measures should be aligned to The Nuclear Decommissioning Authority Group Sustainability Strategy35.	EIA Baseline	Embedded measure

35 Nuclear Decommissioning Authority (2022), (online) Available at: The NDA group Sustainability Strategy 2022 https://www.gov.uk/government/publications/the-nda-group-sustainability-strategy-2022 (Accessed August 2024).

7.7 Assessment methodology

7.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this climate change chapter, it is necessary to set out how this methodology was applied, and adapted as appropriate, to address the specific needs of this GHG assessment.

General approach

7.7.2. The approach applied to the GHG assessment is to quantify and contextualise the GHG emissions of the Proposed Works. The 'with Proposed Works' case has considered the life cycle stages of the Proposed Works as set out within **Table 7-6**. The only assessment case to consider for the GHG assessment of the Proposed Works is the 'with Proposed Works' case. Emissions from a 'without decommissioning' case in the future baseline has not been quantified in this assessment as stated in **Section 7.5.**

Quantification of GHG emissions

7.7.3. The approach to quantifying the GHG emissions associated with the Proposed Works has considered the whole infrastructure life cycle of the works. The infrastructure life cycle phases as described within PAS 2080: Carbon Management in Infrastructure[27] were used. These phases allowed for the identification of the GHG emission sources associated with the Proposed Works. The assessment presents a reasonable worst-case. This methodology is in line with the latest IEMA guidance.[24]

7.7.4. GHG emissions associated with the emissions sources described in **Table 7-6** are generally calculated using the following equation:

$$\boldsymbol{Activity\ data\ X\ GHG\ emissions\ factor = GHG\ emissions\ value}$$

7.7.5. Assumptions were made to characterise the likely activities associated with the Proposed Works and therefore enable GHG emissions to be determined. These assumptions ensure a proportionate assessment has been carried out.

7.7.6. Detailed in **Table 7-6** is the overarching methodology for each defined PAS 2080 infrastructure life cycle stage which was used to characterise the GHG emission sources during the Proposed Works.

Table 7-6 - Activities during each stage of the Proposed Works

Activities during each stage of the Proposed Works Phase	Main stages of the Proposed Works	A1-A2-A3 – Product stage: raw material supply, transport and manufacture	A4 – Construction transport	A5 – Construction process stage	B2-B5 – Maintenance, repair, replacement and refurbishment	B6 – Operational energy use	B7 – Operational water use	B8 – Other operational processes	C1 – Deconstruction	C2 – Transport	C3 – Waste processing for recovery	C4 – Disposal
Preparations for Quiescence phase	Deconstruction								X	X	X	X
	New infrastructure for decommissioning including Safestore, OWPF and DWPF	X	X	X	X*	X*	X*	X*	X*	X*	X*	X*
Quiescence phase	Surveillance period: Safestore inspection and maintenance				X	X	X	X				
Final Site Clearance	Site re-establishment	X	X	X								
	Retrieval and management of stored active waste				X	X	X	X				
	Reactor and reactor building dismantling (Safestore)								X	X	X	X

*OWPF and DWPF only

A1-A2-A3 – Product stage: raw material supply, transport and manufacture

7.7.7. Embodied carbon represents the sum of GHG emissions covering extraction of raw and primary materials and their manufacture and refinement into products and construction materials, as well as the transport and supply logistics to the factory gate. The Royal Institute of Chartered Surveyors (RICS) methodology to calculate embodied carbon[26] along with the Inventory of Carbon and Energy (ICE) Database[36] was used.

7.7.8. For this GHG assessment, the embodied carbon figures from the ICE database are considered as the emission factor, and the weight of the materials considered as the activity data. The embodied carbon figures from the ICE database have been multiplied by the weight of materials associated with material resources. A list of material resources required for Safestore construction has been based upon available design information. Material resources required for the construction of temporary infrastructure, such as the DWPF and buildings for Final Site Clearance phase, have been estimated based on the estimated internal area of the buildings based upon a maximum parameter approach.

A4 – Construction transport

7.7.9. Surface access emissions associated with construction activities for the Safestore and DWPF, were estimated based on trip length and using the Department for Environment, Food and Rural Affairs (Defra) Emissions Factors Toolkit (EFT) (version 12).[37] Details on the number of vehicles were estimated through the traffic and transport workstream (**Chapter 16: Traffic and Transport**). The distances travelled by construction vehicles were estimated using Department for Transport (DfT) datasets[38].

7.7.10. DfT data on commuting distances[39] was used to determine the GHG emissions from construction workers travelling to the Works Area.

A5 – Construction process stage

7.7.11. Construction process emissions (including on-site energy and water use, and waste generated) were calculated using the RICS' construction KPI for process emissions of 1,400 kgCO_2e per £100,000 of construction cost[40].

[36] Circular Ecology (2019). Embodied Carbon – The ICE Database (online). Available at: https://circularecology.com/embodied-carbon-footprint-database.html#.XKX_oJhKhPY (Accessed August 2024).
[37] Defra (2021). Emissions Factors Toolkit v11 (online). Available at: https://laqm.defra.gov.uk/air-quality/air-quality-assessment/emissions-factors-toolkit/ (Accessed August 2024).
[38] DfT (2023). Table RFS0108: Domestic road freight statistics: July 2021 to June 2022 (online). Available at: https://www.gov.uk/government/statistics/domestic-road-freight-statistics-july-2021-to-june-2022 (Accessed August 2024).
[39] DfT (2023). NTS0403e: National Travel Survey: 2022 (online). Available at: https://www.gov.uk/government/statistics/national-travel-survey-2022 (Accessed August 2024).
[40] RICS (2017). Whole life carbon assessment for the built environment (online). Available at: https://www.rics.org/globalassets/rics-website/media/news/whole-life-carbon-assessment-for-the--built-environment-november-2017.pdf (Accessed August 2024).

B2-B5 – Maintenance, repair, replacement and refurbishment

7.7.12. For maintenance, repair, refurbishment, and replacement throughout the use stage, an estimate of GHG emissions was calculated. This was completed using modelling by the Royal Institute of British Architects (RIBA)[41].

B6 – Operational energy use

7.7.13. Energy use was calculated using an estimation of electricity and heating demand of the building types based on Chartered Institution of Building Services Engineers (CIBSE) characterisation[42,43].

7.7.14. Efficiency features of the new infrastructure was considered within the assessment. Annual emission calculations considered the carbon intensity of UK grid electricity (gCO_2e/kWh).

B7 – Operational water use

7.7.15. To calculate emissions associated with operational water, proxy information from case studies and literature reviews, which estimates litres of water used per employee per day, was used.

B8 – Other operational processes

7.7.16. Represents other process GHG emissions arising from the use of the DWPF (in the preparation for Quiescence phase) and supporting facilities (in the Final Site Clearance phase). These emissions arise from processes which enable these facilities to operate and deliver their service. GHG emissions in this category principally related to surface access emissions.

7.7.17. Surface access emissions during the operation of facilities were calculated using vehicle numbers estimated through the traffic and transport workstream (**Chapter 16: Traffic and Transport**), and typical commuting distance from the DfT[39] and the Defra EFT[37].

C1 – Deconstruction

7.7.18. Demolition of residual structures will produce GHG emissions from the operational energy of equipment and the transportation on-site.

7.7.19. GHG emissions from operational energy usage of deconstruction equipment were estimated using information available on the nature and quantity of plant and machinery for each sub-phase. This was supplemented using the RICS' KPI for process emissions of 1,400 $kgCO_2e$ per £100,000 of project cost.

C2 – Transport

7.7.20. Surface access emissions associated with decommissioning activities were assessed using the same methodology as described in paragraphs 7.7.9 to 7.7.10.

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41 RIBA (2017). Embodied and whole life carbon assessment for architects (online). Available at: https://www.architecture.com/-/media/gathercontent/whole-life-carbon-assessment-for-architects/additional-documents/11241wholelifecarbonguidancev7pdf.pdf (Accessed August 2024).

42 CIBSE. (2012). GVF2012 Guide F: Energy Efficiency in Buildings. (Online) Available at: https://www.cibse.org/knowledge-research/knowledge-portal/guide-f-energy-efficiency-in-buildings-2012 (Accessed August 2024).

43 CIBSE. (2012). TM46: Energy Benchmarks. CIBSE; London.

C3 – Waste processing for recovery

7.7.21. GHG emissions from waste processing were estimated using information available on waste types and processing methods. Waste tonnage has been based on quantities presented within **Chapter 19: Conventional Waste** of the ES**.**

C4 – Disposal

7.7.22. Emissions associated with waste disposal were calculated using information available on waste types, quantities and disposal routes. The latest Department for Energy Security and Net Zero (DESNZ) emissions factors[44] were applied.

Determination of significance

7.7.23. Current IEMA guidance[24] states that: "*The crux of significance therefore is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

7.7.24. The significance of GHG emissions associated with the Proposed Works has been evaluated based on the extent to which the Proposed Works materially affects the ability to achieve national, regional and local targets for decarbonisation. The primary basis of contextualisation will be UK carbon budgets (see Table 7-1), including the relevant CCC sectoral allocations (see **Table 7-3**), and the UK carbon target of 'net zero' in 2050.

7.7.25. Regional and local policy for reducing GHG emissions has also be considered but are not the basis of assessment. Consideration has also been given as to whether GHG emissions are appropriately mitigated and compliant with relevant policy.

7.7.26. The significance of the GHG emissions from the Proposed Works is determined based on the criteria in **Table 7-7** developed from the IEMA guidance[24]. Major or moderate adverse effects and beneficial effects are considered to be significant. Minor adverse and negligible effects are not considered to be significant.

Table 7-7 - Significance criteria

Significance	Significance Criteria
Major adverse	The Proposed Works do not make a meaningful contribution to the UK Government meeting their carbon budgets / targets. Adverse GHG impacts are not mitigated and only compliant with do minimum standards. Impacts are also not compliant with requirements of national, regional and local policy.
Moderate adverse	The Proposed Works fall short of fully contributing to the UK Government meeting their carbon budgets / targets. Adverse GHG impacts are partially mitigated and partially meet the requirements of national, regional and local policy.

[44] Department for Energy Security and Net Zero (2023) Greenhouse gas reporting: conversion factors 2023 (online). Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023 (Accessed August 2024).

Significance	Significance Criteria
Minor adverse	The Proposed Works are fully in line with the trajectory of the UK Government meeting their carbon budgets / targets. Adverse GHG impacts are mitigated with good practice design standards and meet the requirements of national, regional and local policy.
Negligible	The Proposed Works have minimal residual GHG emissions and are 'ahead of the curve' when contextualised against the net zero trajectory of the UK Government meeting their carbon budgets / targets. GHG impacts are mitigated through measures that go beyond good practice design standards and the requirements of national, regional and local policy.
Beneficial	The Proposed Works have net GHG emissions below zero, causing a direct or indirect reduction in atmospheric GHG emissions which has a positive impact on the UK Government meeting their carbon budgets / targets.

7.8 Assumptions and limitations

7.8.1. The GHG assessment has been based on the design assumptions described in **Chapter 2: The Decommissioning Process** supplemented by other inputs including the literature sources listed in **Appendix 7A**. These assumptions characterise the likely activities associated with the Works and therefore enable GHG emissions to be determined and support a proportionate assessment of GHG emissions associated with the Works. The assumptions are detailed below.

Preparations for Quiescence phase

7.8.2. It was assumed that in the Preparation for Quiescence phase, 11 zones on the site will be deconstructed as described in **Chapter 2: The Decommissioning Process** (See **Graphic 2.7**). The programme for the deconstruction of these zones is described in **Table 7-8**.

Table 7-8 - Estimate of demolition duration for zones

Zone	Estimated Duration (months)
1	25
2	48
3	13
4	10
5[45]	N/A
6	11

[45] Zone 5 incorporates the 400 kV substation and associated buildings to the south of the Works Area, which is on a long-term lease agreement to National Grid and is therefore not considered to be part of the Proposed Works.

Zone	Estimated Duration (months)
7	33
8	26
9	13
10	22
11	25

7.8.3. The durations presented in **Table 7-8** above have been used in conjunction with the predicted demolition plant items, quantities of these items, and percentage of time the plant items are expected to be in use, to estimate the hours of use of each item and the resultant quantities of fuel that will be required in deconstruction to power these plant items.

7.8.4. **Table 7-9** presents the predicted materials required for Safestore construction and are derived from Safestore optioneering studies, adopting the most carbon intensive option from these studies.

Table 7-9 - Safestore construction materials

Material type	Quantity (m^2)
Vertical Cladding	18,004
Façade Structure	4,392
Roofing	7,294
New roof primary steelwork	1,160
Foundation pads	120
Strips footings	400
Protection wall	3,800
Masonry face and insulation	3,800

7.8.5. The number of HGV and LGV movements associated with the Preparation for Quiescence phase have been obtained from **Chapter 16: Traffic and Transport** of this ES**.** The peak traffic flows associated with the Proposed Development's Preparations for Quiescence phase results in an average of 130 movements per day (65 inbound trips and 65 outbound trips), of which 100 comprises light vehicles (50 inbound and 50 outbound) and 30 by HGV (15 inbound and 15 outbound).

7.8.6. For the calculation of transport emissions, the one-way transport distance for HGVs is estimated to be 108 km. This is based on the Department for Transport[38] dataset on the average length of haul

by type and weight of vehicle. LGV journeys are assumed to be commuting trips, 13.7 km in length, based on Department for Transport Data[39].

7.8.7. For waste disposal in deplanting and deconstruction in the Preparations for Quiescence phase, waste tonnages have been calculated. These tonnages are presented in **Table 7-10.** The latest Department for Energy Security and Net Zero (DESNZ) emissions factors[44] were applied to these quantities**.** It is assumed that these materials will be disposed of in landfill sites or recycled according to the waste hierarchy that is being applied to the waste stream.

Table 7-10 - Waste quantities

Waste type	Waste tonnage (tonnes)
Asbestos	62
Lagging	21
Hazardous miscellaneous materials	195
Clean aluminium	262
Clean cast iron	478
Clean carbon steel	2,603
Clean glass	118
Clean mixed cable	1,337
Non-Hazardous miscellaneous materials	19,402
Clean mild steel	39,828
Clean non ferrous	1,078
Clean plastic	5
Clean stainless steel	1,214
Clean Titanium	212
Clean water	125

Final Site Clearance

7.8.8. There will be a need to erect a number of temporary buildings on the Site to facilitate Final Site Clearance. The design and location of these buildings will be confirmed closer to the time that this phase will be undertaken.

7.8.9. Therefore, for activities related to Final Site Clearance assumptions have been made, where necessary, in order to characterise the likely activities associated with this phase and therefore

enable GHG emissions to be estimated. These assumptions ensure a proportionate assessment has been carried out.

7.8.10. Assumptions have been made to estimate the size of the temporary buildings and the specific type and quantity of materials required for their construction. For the purposes of the assessment, it has been assumed that five industrial buildings will be constructed. These buildings are assumed to have an average floor area of 400 m^2. A Carbon Factor has been used to estimate embodied carbon for each type of material used in the construction of these buildings and the HGV emissions generated from the transportation of materials. These were obtained from the Inventory of Carbon and Energy (ICE) Database.

7.8.11. The precise details of the nature and quantity of plant and machinery for the construction of new structures for Final Site Clearance are unknown at this stage. Therefore, the RICS KPI, which states that emissions should not exceed 1,400 kg CO_2e/£100k, has been used to estimate the process emissions from the construction of new buildings in the Final Site Clearance phase.

7.8.12. The amount of operational energy that these temporary buildings will require to function, has also been estimated based on the assumption that there will be five industrial buildings on site, which will have an average floor area of 400 m^2. Emissions factors and government projections of the carbon intensity of the grid in 2100[46] have been used.

7.8.13. The assumption for operational water use has been derived from a literature review. The reference for office water use (50 litres per person, per day) has been used[47]. This is likely to be an overestimate; however, it represents a worst-case scenario estimate.

7.8.14. The Final Site Clearance phase also includes the deconstruction of the Safestore. Material types and quantities which will be disposed of in the deconstruction of the Safestore, have been extracted from Safestore optioneering studies, adopting the most carbon intensive option from these studies. They are detailed in **Table 7-11.**

Table 7-11 - Safestore deconstruction waste

Waste type	Quantity (m2)
Vertical Cladding	22,404
Façade Steelwork	22,404
Roof Cladding	6,281
Roof Steelwork	6,281
Slab Demolition	3,000
Foundations	120

[46] DESNZ, 2003, Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal [online]. Available at: Green Book supplementary guidance: valuation of energy use and greenhouse gas emissions for appraisal - GOV.UK (www.gov.uk)

[47] South Staffs Water, Water Use in Your Business (online), Available at: waterusebusiness.pdf (south-staffs-water.co.uk) (Accessed August 2024).

Waste type	Quantity (m2)
Strip Footings	400
Protection Wall	1,520
Masonry Face and Insulation	3,800

7.8.15. The above quantities have been used to calculate HGV emissions associated with deconstruction. The figure for the tCO_2/per tonne of material disposed in the Pre-Quiescence and been applied to the quantities in the above table. It is assumed that these materials will be disposed of in landfill sites. This represents a conservative and worst-case scenario approach to calculating these GHG emissions.

7.8.16. It is assumed that the number of LGV movements throughout the Final Site Clearance (for both construction and operation of buildings on the Site and Safestore Deconstruction) are equivalent to the number LGV journeys during the Preparation for Quiescence phase. They are assumed to be commuting trips, 13.7 km in length, based on current Department for Transport Data[39].

7.9 Scope of the assessment

Study Area

Spatial scope

7.9.1. The spatial scope for the GHG emissions assessment was informed by the spatial extent of the Proposed Works, including all activities within the Site during its decommissioning, as well as the GHG emissions associated with transport movements to and from the Proposed Works. Further details of activities considered are provided in **Table 7-6**.

Temporal scope

7.9.2. The temporal scope of the GHG emissions assessment is consistent with the period over which the Proposed Works would take place (a period of 96 years).

Potential receptors

7.9.3. GHG emissions have a global effect rather than directly affecting any specific local receptor to which a level of sensitivity can be assigned. The global climate is therefore the only receptor for the GHG assessment. IEMA Guidance states that the receptor has a high sensitivity, given the severe consequences of global climate change and the cumulative contributions of all GHG emission sources.[24]

Likely significant effects

7.9.4. The likely significant climate change effects that have been taken forward for assessment are summarised in **Table 7-12**. This is based on phases as defined within PAS 2080: Carbon Management in Infrastructure[27] (see

7.9.5. **Graphic-** 7-A) and undertaken with reference to **Chapter 4: Policy and Legislation Overview**. Due to the nature of the Proposed Works, the PAS 2080 infrastructure lifecycle stages do not occur in

sequence, and they have been used selectively to identify the sources of GHG emissions during each phase of the Proposed Works.

Graphic- 7-A - Infrastructure life cycle stages[27]

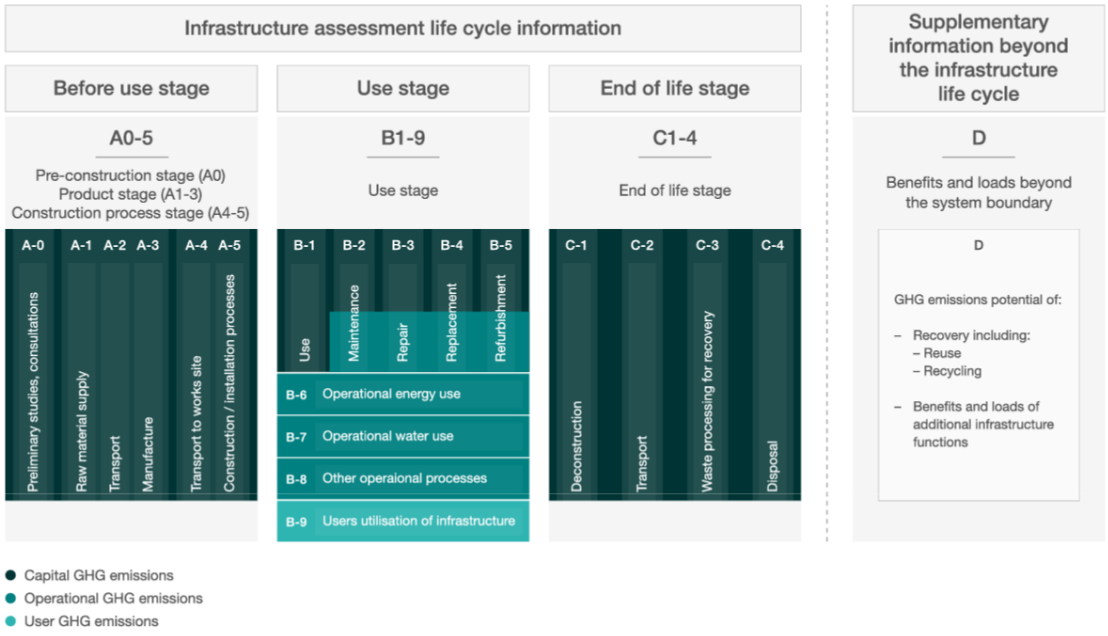

Table 7-12 - Likely significant climate change effects

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
Preparations for Quiescence phase	**Safestore, DWPF and OWPF construction:** construction of a secure building to house the remaining reactors and vault and construction of facilities to process and distribute all low-level solid and liquid waste and intermediate level waste.	**A1-A2-A3 – Product stage: raw material supply, transport and manufacture:** embodied GHG emissions associated with the raw material assets required to construct the Safestore.	**Scoped in**
		A4 – Construction transport: transport of construction materials resources and equipment from point of purchase to the works site. Commuting of workforce during construction.	**Scoped in**
		A5 – Construction process stage: emissions associated with construction and installation processes (including fuel and electricity consumption) of the temporary works, ground works, landscaping and permanent works. Emissions associated with site water demand. Waste management activities (transport,	**Scoped in**

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
		processing, final disposal) associated with waste arising from the Safestore construction.	
		A5 – Construction process stage (land-use change): emissions associated with land use change are usually calculated on a national level. GHG emissions from changes in land use type associated with the Proposed Works are expected to be minimal and have been scoped out from the assessment.	*Scoped out*
	DWPF and OWPF Operational phase: Operation of facilities to process and distribute all low-level solid, liquid waste and intermediate level waste.	**B1 – Boundary of use stage: installed products and materials:** called 'use', this represents the carbon emitted directly from the fabric of products and materials once they have been installed as part of infrastructure and it is in normal use. It is not anticipated that any of the materials used in the construction of the DWPF and OWPF will be capable of emitting carbon directly.	*Scoped out*
		B2-B5 – Maintenance, repair, replacement and refurbishment: represents the works activities and new materials for the maintenance, repair, replacement and refurbishment of the DWPF and OWPF during the use stage / operation. Due to the temporary nature and relatively small size of the DWPF and OWPF, GHG emissions are likely to be minimal and have been scoped out of the assessment.	*Scoped out*
		B6 – Operational energy: Operational energy use emissions resulting from the energy used by the DWPF and OWPF to enable it to deliver its service during operation. Energy use is likely to be minimal and this stage has been scoped out of the assessment	*Scoped out*
		B7 – Operational water: Operational water use emissions resulting from the consumption of water required by the DWPF and OWPF to operate and deliver its service. Water use is likely to be minimal and this stage has been scoped out of the assessment.	*Scoped out*

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
		B8 – Other operational processes: represents other process GHG emissions arising from the DWPF to enable it to operate and deliver its service. This includes GHG emissions from operational transport. These journeys are accounted for in the numbers of HGV and LGV journeys associated with Deconstruction and Safestore construction, therefore they have been scoped out of this stage.	*Scoped out*
		B9 – User's utilisation of infrastructure: represents the activities associated with user's utilisation during the use stage. This is defined by the principle of control and influence whereby the GHG emissions are B9 (user's utilisation) when they arise from an activity that the user has control over. This stage is not relevant to the operation of the DWPF and OWPF and is scoped out of the assessment.	*Scoped out*
	Deconstruction: demolish all buildings to ground level in the Works Area, including DWPF and OWPF, but excluding the reactor building and associated infrastructure.	**C1 – Deconstruction:** represents the on-site activities of deconstructing, dismantling and demolishing infrastructure. For example, emissions arising through the use of plant and transport on-site.	**Scoped in**
		C2 – Transport: this represents all carbon emissions due to transport to disposal.	**Scoped in**
		C3 – Waste processing for recovery: represents the activities associated with treatment and processing for recovery, reuse and recycling of waste materials arising from the deplanting. This includes use of all waste material outputs from dismantling, deconstruction or demolition of the infrastructure and covers all debris, all construction products, materials or construction elements, etc. arising from the deplanting and operational activities associated with waste management facilities on site. Clean rubble will be repurposed onsite, without the requirement for waste disposal.	*Scoped out*

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
		It is assumed that other categories of waste will be disposed of and emissions are captured in the category **C4 – Disposal.** Therefore, this emissions source has been scoped out of the assessment.	
		C4 – Disposal: includes the carbon emissions resulting from final disposal of demolition materials. This category also includes any possible post-transportation treatment that is necessary before final disposal.	**Scoped in**
Quiescence phase	**Surveillance period:** Safestore inspection and maintenance.	**B1 – Boundary of use stage: installed products and materials:** called 'use', this represents the carbon emitted directly from the fabric of products and materials once they have been installed as part of infrastructure and it is in normal use. It is not anticipated that any of the materials used in the construction of the Safestore will be capable of emitting carbon directly.	*Scoped out*
		B2-B5 – Maintenance, repair, replacement and refurbishment: represents the works activities and new materials for the maintenance, repair, replacement and refurbishment of the Safestore during the use stage / operation. The selection of highly durable materials, careful design and high quality construction of the Safestore, supports the infrequent need for maintenance of the facility. GHG emissions are therefore likely to be minimal and have been scoped out of the assessment.	*Scoped out*
		B6 – Operational energy use: emissions resulting from the energy used by the Safestore to enable it to deliver its service during operation. The design basis of the Safestore is such that it requires only a minimal programme of work to sustain the safe, stable, passive storage conditions and the continued integrity of the 'safe stored' reactors and site. Energy use is likely to be minimal and this stage has been scoped out of the assessment.	*Scoped out*

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
		B7 – Operational water use: emissions resulting from the consumption of water required by the Safestore to operate and deliver its service. The design basis of the Safestore is such that it requires only a minimal programme of work to sustain the safe, stable, passive storage conditions and the continued integrity of the 'safe stored' reactors and site. Water use is likely to be minimal and this stage has been scoped out of the assessment.	*Scoped out*
		B8 – Other operational processes: represents other process GHG emissions arising from the Safestore to enable it to operate and deliver its service including management of operational waste. Includes GHG emissions from operational transport. There will be periodic visits by a centrally based team to inspect and monitor the site and its environs. GHG emissions are likely to be minimal and this stage has been scoped out of the assessment.	*Scoped out*
		B9 – User's utilisation of infrastructure: represents the activities associated with user's utilisation during the use stage. This is defined by the principle of control and influence whereby the GHG emissions are B9 (user's utilisation) when they arise from an activity that the user has control over. This stage is not relevant to the operation of the Safestore and is scoped out of the assessment.	*Scoped out*
Final Site Clearance	**Site re-establishment:** new facilities construction for final decommissioning, including a Waste Management Centre (WMC).	**A1-A2-A3 – Product stage: raw material supply, transport and manufacture:** embodied GHG emissions associated with the raw material assets required to construct new facilities required to facilitate Final Site Clearance, such as the WMC.	**Scoped in**
		A4 – Construction transport: transport of construction materials resources and equipment from point of purchase to the works site. Commuting of workforce during construction.	**Scoped in**

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
		A5 – Construction process stage: emissions associated with construction and installation processes (including fuel and electricity consumption) of the temporary works, ground works, landscaping and permanent works. Emissions associated with site water demand. Waste management activities (transport, processing, final disposal) associated with waste arising from the construction.	**Scoped in**
		A5 – Construction process stage (land-use change): emissions associated with land use change are usually calculated on a national level. GHG emissions from changes in land use type associated with the Proposed Works are expected to be minimal and have been scoped out from the assessment.	*Scoped out*
	Retrieval and management of stored active waste: wastes transferred to WMC and sent to a suitable waste repository.	**B1 – Boundary of use stage: installed products and materials:** called 'use', this represents the carbon emitted directly from the fabric of products and materials once they have been installed as part of infrastructure and it is in normal use. It is not anticipated that any of the materials used in the construction of the facilities will be capable of emitting carbon directly.	*Scoped out*
		B2-B5 – Maintenance, repair, replacement and refurbishment: represents the works activities and new materials for the maintenance, repair, replacement and refurbishment of the WMC and supporting facilities during the use stage / operation.	**Scoped in**
		B6 – Operational energy use: emissions resulting from the energy used by the WMC and supporting facilities to enable it to deliver its service during operation.	**Scoped in**
		B7 – Operational water use: emissions resulting from the consumption of water required by the WMC and supporting facilities to operate and deliver its service.	**Scoped in**
		B8 – Other operational processes: represents other process GHG emissions	**Scoped in**

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Scoped in / out
		arising from the WMC and supporting facilities to enable it to operate and deliver its service including management of operational waste.	
		B9 – User's utilisation of infrastructure: *represents the activities associated with user's utilisation of the Safestore during the use stage. This is defined by the principle of control and influence whereby the GHG emissions are B9 (user's utilisation) when they arise from an activity that the user has control over. This stage is not relevant to the operation of the facilities and is scoped out of the assessment.*	*Scoped out*
	Reactor and reactor building dismantling (Safestore): dismantling and demolition of reactor and reactor building (Safestore), deconstruction of any other facilities and site clearance.	**C1 – Deconstruction:** represents the on-site activities of deconstructing, dismantling and demolishing the infrastructure. For example, emissions arising through the use of plant and transport on-site.	**Scoped in**
		C2 – Transport: this represents all carbon emissions due to transport to disposal.	**Scoped in**
		C3 – Waste processing for recovery: represents the activities associated with treatment and processing for recovery, reuse and recycling of waste materials arising from the Final Site Clearance. This includes use of all waste material outputs from dismantling, deconstruction or demolition of the infrastructure and covers all debris, all construction products, materials or construction elements, etc. arising from the Final Site Clearance.	**Scoped in**
		C-4 – Disposal: includes the carbon emissions resulting from final disposal of demolition materials. This category also includes any possible post-transportation treatment that is necessary before final disposal.	**Scoped in**

7.10 Assessment of effects

Preparations for Quiescence phase

Construction (Safestore, DWPF and OWPF)

Raw materials supply, transport and manufacture

7.10.1. The embodied GHG emissions associated with the raw material assets required to construct the Safestore are estimated as 19.5 $ktCO_2e$. The emissions associated with raw material assets required to construct the DWPF are estimated at 4.5 $ktCO_2e$ and the corresponding raw materials emissions for the OWPF are estimated at 2. 7 $ktCO_2e$.

Construction transport

7.10.2. This represents all carbon emissions from HGV journeys required for the construction of the Safestore and DWPF. It also includes the emissions associated with construction workers commuting. The total of these GHG emissions are calculated at 1 $ktCO_2e$.

Construction process stage

7.10.3. Emissions associated with construction and installation processes in the Preparation for Quiescence phase (including fuel and electricity consumption) are estimated as 0.2 $ktCO_2e$.

Deconstruction

Deconstruction

7.10.4. The emissions related to on-site activities of deconstructing, dismantling and demolishing infrastructure, for example, emissions arising through the use of plant and transport on-site are estimated as 171 $ktCO_2e$.

Transport

7.10.5. This represents all carbon emissions due to transport of materials and wastes to the location of disposal and the worst case that material is imported to site to fill voids created from deplanting and deconstruction activities. GHG emissions associated with this process in the deconstruction activities of the Proposed Works are estimated as 5 $ktCO_2e$.

Disposal

7.10.6. The estimate of carbon emissions resulting from final disposal of demolition materials are 0. 4 $ktCO_2e$ which is based on the assumption that all demolition material is exported to landfill.

Summary

7.10.7. The total GHG emissions associated with the Preparations for Quiescence phase are estimated to be around 204 $ktCO_2e$ of which 83% are associated with on-site activities of deconstructing, dismantling and demolishing, and 13% is embodied carbon associated with the use of new materials for the Safestore and DWPF.

Final Site Clearance

Site Re-establishment

Raw materials supply, transport and manufacture

7.10.8. The embodied GHG emissions associated with the raw material assets required to construct new facilities required to facilitate Final Site Clearance are estimated to be around 4 $ktCO_2e$.

Construction transport

7.10.9. The transport of construction materials resources and equipment from point of purchase to the works site for the construction of new facilities for Final Site Clearance and emissions related to the commuting workforce during this period are estimated as 0.3 $ktCO_2e$.

Construction process stage

7.10.10. Emissions associated with construction and installation processes involved in site re-establishment are estimated as 1.1 $ktCO_2e$.

Retrieval and management of stored active waste

Maintenance, repair, replacement and refurbishment

7.10.11. Emissions related to the works activities and new materials for the maintenance, repair, replacement and refurbishment of the WMC and supporting facilities during the use stage / operation are calculated as 3 $ktCO_2e$.

Operational energy

7.10.12. Emissions resulting from the energy used by the WMC and supporting facilities to enable it to deliver its service during operation are estimated at 0.01 $ktCO_2e$.

Operational water

7.10.13. Emissions resulting from the consumption of water required by the WMC and supporting facilities to operate and deliver its service are estimated at 0.002 $ktCO_2e$.

Other operational processes

7.10.14. Other process GHG emissions arising from the WMC and supporting facilities to enable it to operate and deliver its service including the emissions associated with commuting workers are estimated at 1 $ktCO_2e$.

Reactor and reactor building dismantling

Deconstruction

7.10.15. The on-site activities of deconstructing, dismantling and demolishing the infrastructure, for example, emissions arising through the use of plant and transport on-site, are estimated as 6 $ktCO_2e$.

Transport

7.10.16. All carbon emissions due to transport to disposal are calculated as 0.5 $ktCO_2e$.

Waste processing for recovery

7.10.17. This category represents the activities associated with treatment and processing for recovery, reuse and recycling of waste materials arising from the reactor and reactor building dismantling. It is

assumed, as a worst-case scenario, that there will be no recovery of waste. As a result, there are no emissions associated with waste processing recovery in the deconstruction phase.

Disposal

7.10.18. The carbon emissions resulting from final disposal of demolition materials associated with the reactor and Safestore are calculated as 0.1 $ktCO_2e$.

Summary

7.10.19. The total lifetime GHG emissions associated with the Final Site Clearance of the Proposed Works are estimated to be around 16 $ktCO_2e$.

Summary

7.10.20. Overall lifetime GHG emissions associated with the Proposed Works during its decommissioning are estimated to be 220 $ktCO_2e$. A summary of the phased lifecycle GHG emissions assessment is presented in **Table 7-13.**

Table 7-13 - Lifecycle emissions over the duration of the Proposed Works

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Estimated lifetime GHG emissions (ktCO2e)
Preparations for Quiescence phase	**Safestore, DWPF and OWPF construction:** construction of a secure building to house the remaining reactors and vault and construction of facilities to process and distribute all low-level solid and liquid waste and intermediate level waste	**A1-A2-A3 – Product stage: raw material supply, transport and manufacture**	**27**
		A4 – Construction transport	**1**
		A5 – Construction process stage.	**0.2**
	Deconstruction: demolish all buildings to ground level in the Works Area, including DWPF and OWPF, but excluding the reactor building and associated infrastructure.	**C1 – Deconstruction:** use of plant and transport on-site.	**171**
		C2 – Transport:	**5**
		C4 – Disposal	**0.4**
Final Site Clearance	**Site re-establishment:** new facilities construction for final decommissioning, including a Waste Management Centre (WMC).	**A1-A2-A3 – Product stage: raw material supply, transport and manufacture**	**4**
		A4 – Construction transport	**0.3**
		A5 – Construction process stage	**1**

Phase	Main stages of the Proposed Works	Sources of GHG emissions	Estimated lifetime GHG emissions (ktCO2e)
	Retrieval and management of stored active waste: wastes transferred to WMC and sent to a suitable waste repository.	**B2-B5 – Maintenance, repair, replacement and refurbishment:**	**3**
		B6 – Operational energy use	**0.01**
		B7 – Operational water use	**0.002**
		B8 – Other operational processes	**1**
	Reactor and reactor building dismantling (Safestore): dismantling and demolition of reactor and reactor building (Safestore), deconstruction of any other facilities and site clearance.	**C1 – Deconstruction**	**6**
		C2 – Transport	**0.5**
		C3 – Waste processing for recovery	**0**
		C-4 – Disposal	**0.1**

7.11 Contextualisation against relevant UK carbon budgets

7.11.1. The significance of GHG emissions associated with the Proposed Works is evaluated based on the extent to which the Proposed Works materially affects the ability to achieve national, regional and local targets for decarbonisation. The primary basis of contextualisation is the UK carbon budgets, including the relevant CCC sectoral allocations. Regional and local policy for reducing GHG emissions is also considered but are not the basis of assessment. Consideration is also given as to whether GHG emissions are appropriately mitigated and compliant with relevant policy.

7.11.2. The GHG assessment has considered GHG emissions from the Proposed Works in three separate phases: Preparations for Quiescence phase, Quiescence phase and Final Site Clearance. The preparations for Quiescence phase of the Proposed Works runs for approximately 13 years from 2026. GHG emissions from this phase will therefore fall within the 4th, 5th and 6t^{h} carbon budgets.

7.11.3. Further stages will fall entirely within future budgets once set.

7.11.4. **Table 7-14** presents the net $ktCO_2e$ associated with the Preparations for Quiescence phase, Quiescence phase and Final Site Clearance phases of the Proposed Works during each of the legislated carbon budget periods.

Table 7-14 - Lifecycle emissions contextualised against the UK carbon budgets

Phase of Proposed Works	Estimated lifetime GHG emissions (ktCO2e)	Net Proposed Works GHG emissions per relevant carbon budget (ktCO2e) and 2050 net zero target (ktCO2e/yr)		
		4th (2023 to 2027)	5th (2028 to 2032)	6th (2033 to 2037)
Total UK carbon budget		1,950,000	1,725,000	965,000
CCC sector allocation		189,200	92,700	35,800
Preparations for Quiescence phase		34.0	85.0	85.0
Quiescence phase		-	-	-
Final Site Clearance				
Total		**34.0**	**85.0**	**85.0**
Total % of UK carbon budget		**0.002%**	**0.005%**	**0.009%**
Total % of CCC sector allocation		**0.018%**	**0.09%**	**0.24%**

7.11.5. This assessment has established that the Proposed Works' lifetime net GHG emissions will equate to: 0.002% of the UK's fourth carbon budget, 0.005% of the UK's fifth carbon budget and 0.009% of the UK's sixth carbon budget. In this context, it is concluded that the Proposed Works will not have a material adverse effect on the UK Government meeting its carbon budgets / targets. In this context, it is not considered that the lifetime net GHG emissions will have a material adverse effect on the achievement of local policy objectives.

7.11.6. As a result, in accordance with the assessment methodology and criteria for defining significance in **Table 7-7**, the Proposed Works are assessed as having a **minor adverse effect** and is therefore assessed as being **Not Significant.**

7.12 Assessment of cumulative effects

Inter-Project effects

7.12.1. There is the potential for climate change effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

7.12.2. An assessment inter-project effects is considered within in **Chapter: 21: Cumulative Effects Assessment** of this ES

Intra-Project effects

7.12.3. Consideration has been given as to whether any of the climate change receptors are likely to be subject to cumulative intra-project effects because of other environmental topic effects upon the

same receptor. The global climate is the only receptor for the climate change assessment and therefore the Proposed Works are not expected to result in any significant intra-project effects.

7.13 Climate change resilience

7.13.1. The measures to ensure climate change resilience of the Proposed Works are reported in relevant aspect chapters of the ES. The environmental measures identified in topic assessments related to improving the climate change resilience of the Proposed Works have been reproduced in **Table 7-15**.

Table 7-15 - Climate change resilience measures

Chapter	Environmental measure	Relevance for climate change resilience
6: Air Quality	Good practice air quality measures as described in the IAQM guidance on the Assessment of Dust from Demolition and Construction will be employed across the Project and incorporated in the Environmental Management Plan.	A decrease in summer precipitation may contribute to an increase in dust emissions, resulting in adverse effects on human receptors during the Preparation for Quiescence phase and Final Site Clearance. This will be mitigated by dust management measures that will be implemented on site through use of the EMP. An outline EMP has been submitted as part of this EIADR to frame the future development of this document.
12: Soils, Geology and Hydrogeology	In accordance with LCRM, consideration will be given to climate change effects in land contamination risk assessment completed during the Proposed Works. Assessments will give regard, as appropriate, to available relevant industry guidance, such as SoBRA (2022) Guidance on Assessing Risk to Controlled Waters from UK Land Contamination Under Conditions of Future Climate Change. This will be secured in the Environmental Management Plan.	Climate change may influence the hydrogeological regime, including potential changes in rainfall runoff, infiltration and recharge rates. Land contamination risk assessments will mitigate against the risks these changes may bring to prevent adverse effects from a land contamination perspective.
11: Surface Water and Flood Risk	In accordance with Planning Policy, the design event for the purposes of the Flooding Risk Assessment is the 0.5% Annual Exceedance Probability (plus climate change) for the duration of the Proposed Works. The future baseline section has considered EA climate change allowances based upon	Climate change and associated increase in winter rainfall, intense storm events and sea level rise pose a risk to the site of the reactor and Safestore. Accounting for climate change in the Flooding Risk Assessment and the embedded mitigations provided by the

Chapter	Environmental measure	Relevance for climate change resilience
	the latest UKCP18 climate change scenarios. This includes information derived from a range of coastal and pluvial modelling studies, which taken together with a range of existing and proposed embedded environmental measures will help minimise any potential effects towards flood risk receptors. The Flooding Risk Assessment concludes that due to climate change, on-site flood risk from tidal and pluvial sources is likely to increase throughout the lifetime of the development. Any potential flood-risk impacts on buildings will be mitigated by design to keep flood-water from tidal or pluvial sources out of any proposed structures for their proposed design life. In particular, this will require raising the proposed OWPF and DWPF at least 0.3 m above surrounding ground levels and protecting the Safestore from tidal floodwater depths of up to 0.3 m. Any potential impact on humans is limited to those that could potentially be working within the Works Area during extreme events (there is no on-site accommodation). This will be mitigated by the use of flood- and weather-warning systems. The HPB Safety Case will be periodically reviewed to take account of future updates to climate change allowances. Should changes in coastal protection be required then the HPB Safety Case process will ensure their timely identification. This will be secured by the Environmental Management Plan.	Coastal Protection and Flood Risk Adaptation Measures and will help prevent damage or deterioration to the assets resulting from extreme precipitation the action of pluvial flooding and sea level rise.

8

Terrestrial biodiversity and ornithology

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8 Terrestrial biodiversity and ornithology

8.1 Introduction

8.1.1. This chapter sets out the assessment of the effects of the Proposed Works on terrestrial biodiversity and ornithology. It includes the assessment of effects on birds, recognising that this group of taxa spans terrestrial, freshwater and marine environments.

8.1.2. Within this chapter, 'terrestrial ecological features' are defined as those ecological features (species, habitats and ecosystems[1]) that are relevant to the area above mean high water springs (MHWS). The effects of the Proposed Works on ecological features that are relevant to the area below MHWS are considered in **Chapter 9: Marine biodiversity.**

8.1.3. **Chapter 11: Surface water and flood risk** and **Chapter 12: Soils, geology and hydrogeology** do not identify any hydraulic links between the Indicative Dismantling Works Area ('the Works Area') and ecological features that are potentially of biodiversity conservation importance. Effects on freshwater biodiversity are therefore scoped-out of the assessment. The exception to this is the assessment of effects on anadromous and catadromous fish species in the marine environment, which is provided in **Chapter 9: Marine biodiversity**.

8.1.4. This chapter should be read in conjunction with the description of the Proposed Works in **Chapter 2: The Decommissioning process, Chapter 6: Air Quality** and **Chapter 16: Traffic and Transport**.

8.1.5. This chapter is supported by the following figures provided in Volume II of this ES:

- Figure 8.1 - The Site and Works Area;
- Figure 8.2 – Statutory Biodiversity Conservation Sites: European Sites;
- Figure 8.3 – Statutory Biodiversity Conservation Sites: National Sites;
- Figure 8.4 – Non-Statutory Biodiversity Conservation Sites;
- Figure 8.5 – Habitats; and
- Figure 8.6 – Bat Roost Suitability.

8.1.6. This chapter is supported by the following appendices provided in Volume III of this ES:

- Appendix 8A - Baseline Report: Desk Study;
- Appendix 8B - Baseline Report: Phase 1 Habitat Survey;
- Appendix 8C - Baseline Report: Otter and Water Vole;
- Appendix 8D – Baseline Report: Badger;
- Appendix 8E – Baseline Report: Bats;
- Appendix 8F – Baseline Report: Breeding and Non-Breeding Birds;
- Appendix 8G - Baseline Report: Great Crested Newt;

[1] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

- Appendix 8H - Baseline Report: Reptiles;
- Appendix 8I - Baseline Report: Invertebrates;
- Appendix 8J – Baseline Verification Report;
- Appendix 8K – Bat Survey – Building 597; and
- Appendix 8L – Biodiversity Net Gain: Baseline.

8.2 Relevant legislation, policy and technical guidance

Legislation

8.2.1. The legislation summarised in **Table 8-1** is relevant to the assessment of effects on terrestrial biodiversity and ornithology.

Table 8-1 - Legislation relevant to terrestrial biodiversity and ornithology

Legislation	Legislation relevance
Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive)[2]	Adopted in 1992, the Habitats Directive, along with the Birds Directive, established the EU-wide Natura 2000 ecological network of protected areas to be safeguarded against potentially damaging developments. These areas are also referred to as 'European Sites'[3] and now form the UK's national site network. The Habitats Directive also lists species that are of conservation concern and require legal protection in Europe.
Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive)[4]	The Birds Directive, through the establishment of Special Protection Areas (SPA), provides designated sites to protect European wild bird species, and the habitats of listed species.

[2] European Commission (1992). Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN. (Accessed: August 2024).

[3] 'European Sites' include Special Protection Areas (SPAs) designated in accordance with the Birds Directive and Special Areas of Conservation (SACs) designated in accordance with the Habitats Directive. These designations protect species and habitats that are biodiversity conservation priorities across Europe. European Sites now form part of the UK's national site network and the designation and protection of these sites continues to apply.

[4] European Commission (2009). Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds (codified version). (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009L0147&from=EN. (Accessed: August 2024).

Legislation	Legislation relevance
Ramsar Convention on Wetlands of International Importance 1971[5]	The Ramsar Convention is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. It encourages the designation of sites containing rare, unique, or representative wetland habitats, or wetlands important for conserving biodiversity. It was ratified by the UK, along with the designation of its first Ramsar sites, in 1976. Most Ramsar are linked to the UK's national site network - either as a SPA or Special Area of Conservation (SAC).
The Conservation of Habitats and Species Regulations 2017 (as amended[6]**) (Habitats Regulations)**[7]	Domestic UK law which transposed the land and marine aspects of the Habitats Directive, and elements of the Wild Birds Directive.
Wildlife and Countryside Act 1981 (as amended)[8]	The Wildlife and Countryside Act 1981 was enacted primarily to implement the Birds Directive and Bern Convention in Great Britain, supplemented by the Wildlife and Countryside (Service of Notices) Act 1985[9].
Protection of Badgers Act 1992[10]	The Protection of Badgers Act consolidates previous legislation, making it an offence to kill, injure or take a badger, or to damage/interfere with a sett, unless a licence is obtained from a relevant authority.
The Hedgerows Regulations 1997[11]	Enacted to protect important countryside hedges from destruction and/or damage. The regulations cover hedges of at least 20 m in length or connected at both ends to another hedgerow of any length and legislates against uprooting or other damage.

5 UNESCO (1971). Ramsar Convention on Wetlands of International Importance 1971 (online). (Online). Available at: https://www.ramsar.org/sites/default/files/documents/library/current_convention_text_e.pdf. (Accessed: August 2024).

6 Including amendments made by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

7 UK Government (2017). The Conservation of Habitats and Species Regulations 2017 as amended. (Online). Available at: http://www.legislation.gov.uk/uksi/2017/1012/contents (Accessed: August 2024).

8 UK Government (1981). Wildlife and Countryside Act 1981 (as amended). (Online). Available at: http://www.legislation.gov.uk/ukpga/1981/69 (Accessed: August 2024)

9 UK Government. (1985). Wildlife and Countryside (Service of Notices) Act 1985. (Online). Available at: https://www.legislation.gov.uk/ukpga/1985/59/contents (Accessed: August 2024).

10 UK Government (1982) Protection of Badgers Act 1992. (Online). Available at: http://www.legislation.gov.uk/ukpga/1992/51. (Accessed: August 2024).

11 UK Government (1997) The Hedgerows Regulations 1997. (Online). Available at: http://www.legislation.gov.uk/uksi/1997/1160/made (Accessed: August 2024).

Legislation	Legislation relevance
Countryside and Rights of Way Act 2000 (CroW Act)[12]	Implemented to cover four main areas: access to the open country; public rights of way, nature conservation, and Areas of Outstanding Natural Beauty (AONB). Created a new, statutory right of access on foot to certain types of open land, and modernised the public rights of way system, as well as strengthening aspects of nature conservation legislation.
Natural Environment and Rural Communities Act 2006 (NERC Act)[13]	Places a duty on every public authority, in exercising its functions, to have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity. Pursuant to **Section 41** of the NERC Act, the Secretary of State has published a list of habitats and species that are of Principal Importance for the Conservation of Biodiversity in England.
The Environment Act 2021[14]	The Environment Act includes provisions to strengthen and improve the duty on public bodies to conserve and enhance biodiversity, including mandating biodiversity gain through the planning system.

Policy

8.2.2. A summary of the relevant policies is presented in **Table 8-2**.

Table 8-2 - Policy relevant to terrestrial biodiversity and ornithology

Policy reference	Policy relevance
National Policy	
National Planning Policy Framework (NPPF) (2023)[15]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner*". Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it provides information in relation to achieving sustainable development. Paragraph 180 (**Section 15**), states that: 'Planning policies and decisions should contribute to and enhance the natural and local environment by: A. protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);

[12] UK Government (2000). Countryside and Rights of Way Act 2000. (Online). Available at: http://www.legislation.gov.uk/ukpga/2000/37 (Accessed: August 2024).
[13] UK Government (2006). Natural Environment and Rural Communities Act 2006. (Online). Available at: http://www.legislation.gov.uk/ukpga/2006/16 (Accessed: August 2024).
[14] UK Government (2021). The Environment Act 2021. (Online). Available at: https://www.legislation.gov.uk/ukpga/2021/30 (Accessed: August 2024).
[15] Ministry of Housing, Communities and Local Government (2023). National Planning Policy Framework. (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/810197/NPPF_Feb_2019_revised.pdf (Accessed: August 2024).

Policy reference	Policy relevance
	B. recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland; C. maintaining the character of the undeveloped coast, while improving public access to it where appropriate; D. minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; E. preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and F. remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.' Paragraph 181 (**Section 15**), states that 'plans should: distinguish between the hierarchy of international, national and locally designated sites; allocate land with the least environmental or amenity value, where consistent with other policies in this Framework[16]; take a strategic approach to maintaining and enhancing networks of habitats and green infrastructure; and plan for the enhancement of natural capital at a catchment or landscape scale across local authority boundaries' Paragraph 185 (**Section 15**) states 'To protect and enhance biodiversity and geodiversity, plans should: A. Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national, and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration, or creation; and B. promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity'. Paragraph 186 states that '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;

[16] Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality. The availability of agricultural land used for food production should be considered, alongside the other policies in this Framework, when deciding what sites are most appropriate for development.

Policy reference	Policy relevance
	B. development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the Site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest; 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 reasons67 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.' Paragraph 187 states that 'the following should be given the same protection as habitats sites[17]: A. potential Special Protection Areas and possible Special Areas of Conservation; B. listed or proposed Ramsar sites[18]; and C. sites identified, or required, as compensatory measures for adverse effects on habitats sites, potential Special Protection D. Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites'. Paragraph 188 states that 'The presumption in favour of sustainable development does not apply where the plan or project is likely to have a significant effect on a habitats site (either alone or in combination with other plans or projects) unless an appropriate assessment has concluded that the plan or project will not adversely affect the integrity of the habitats site.
Local Policies	
Adopted West Somerset Local Plan to 2032 (2016)[19]	Policy NH6: Nature Conservation and The Protection and Enhancement of Biodiversity states that '*Development proposals will be required to demonstrate that they are:* avoiding unacceptable adverse impacts on biodiversity;

[17] 'Habitats Sites' include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, proposed SAC, potential SPA, and sites compensating for damage to SAC/SPA.

[18] Potential Special Protection Areas, possible Special Areas of Conservation and proposed Ramsar sites are sites on which Government has initiated public consultation on the scientific case for designation as a Special Protection Area, candidate Special Area of Conservation or Ramsar site.

[19] West Somerset Council (2016). West Somerset Local Plan to 2032. (Online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (Accessed August 2024)

Policy reference	Policy relevance
	incorporating measures to protect or mitigate to acceptable levels (or, as a last resort, proportionately compensate for) adverse impacts on biodiversity, ensuring a net gain in biodiversity where possible. The Somerset 'habitat evaluation procedure' is used in calculating the value of a site to species affected by a proposal as appropriate. Where habitat is replaceable, mitigation techniques need to be proven; protecting, enhancing and restoring the ecological network in West Somerset. The weight of protection afforded to a site that contributes to the district's biodiversity will reflect its role in maintaining connectivity and resilience of the local ecological network; and a Habitat Regulations Assessment (HRA) is required where development is proposed which affects European and internationally designated sites and for areas that ecologically support the integrity of these sites.' Policy NH11: Bat Consultation Zone states that 'Planning applications for development within the West Somerset bat consultation zone may require a 'test of significance' under the Habitats Regulations, requiring details of survey work, reports and avoidance/mitigation measures. This is to secure the conservation objectives of the Barbastelle bat feature of Exmoor and Quantocks Oak Woodlands Special Area of Conservation from effects outside of its boundaries.' West Somerset District Local Plan (Adopted April 2006) Policies that remain extant from the West Somerset District Local Plan (2006) following the adoption of the West Somerset Local Plan to 2032: Policy TW/1: Trees and Woodland Protection: Development proposals will be required to demonstrate that woodlands, groups of trees and individual trees of significant landscape, wildlife or amenity value will be protected or, where this is unavoidable, replaced with additional tree planting. Policy TW/2: Hedgerows Development proposals will be required to demonstrate that existing hedgerows and hedgerow trees will be retained and protected unless they are not considered to be of value to the area's landscape, character or wildlife. Policy NC/1: Sites of Special Scientific Interest Development proposals will be required to demonstrate that SSSIs will not be adversely affected. Where adverse effects are unavoidable, the development will only be permitted providing: (i) there are no alternative means of meeting the development need, and (ii) the reasons for the development outweigh the value of the Site and national policy to safeguard the national network of SSSIs. Where the Site is a National Nature Reserve (NNR) or a site identified under the Nature Conservation Review or Geological Conservation Review the development is required to demonstrate particular regard to the Site's national importance, identifying measures to protect and enhance the Site's nature conservation interest.
Somerset West and Taunton Local Plan Issues and Options	The objectives set the framework for the Local Plan. Objective 7 is "*to protect and enhance the environmental, historic, economic and wellbeing value of the District's*

Policy reference	Policy relevance
Document (consultation draft) 2020[20]	*distinctive landscapes biodiversity and local character*". Additional polices to meet the objective, which are of relevance to biodiversity, include: "*7b/1 Maintain and enhance biodiversity, taking into account climate change and the need for habitats and species to adapt to it. Requirement of a net gain in biodiversity from new development using the Somerset Habitat Evaluation Procedure which could include re-wilding and tree planting;-7b/2 Protect and enhance the coherence and resilience of the ecological network and avoid/minimise the loss of or damage to trees, woodland and hedgerows…;* *7b/5 Protect, conserve or enhance landscape and townscape character whilst maintaining green wedges, green infrastructure networks and open breaks between settlements exploring opportunities for Local Green Space designations…;* *7b/9 Protect the landscape, environmental quality, nature conservation, fisheries and recreational interest of water courses and wetlands and improve public access to, along and from our waterways; and* *7b/10 Development on sites within the Bat and Wildfowl Consultation Zones will require a 'test of significance' under the Habitat Regulations to be carried out…*" As stated in **Chapter 3: Alternatives**. Somerset West and Taunton Council are no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council.
Sedgemoor Local Plan[21]	The local plan policies include reference to the need to address pressures on key species and designated sites from habitat loss through to recreational pressure. The following policies are relevant to ecology: Policy D20 refers to biodiversity and geodiversity. Policy D21 relates to Ecological Networks. Policy D22 relates to Trees and Woodland. Policy D23 relates to Bat Consultation Zones

Technical guidance

8.2.3. Technical guidance that is relevant to the assessment of the effects on terrestrial biodiversity and ornithology is presented in **Table 8-3**. This includes elements of Scottish guidance that includes information that is of relevance elsewhere in the UK, for example relating to species that occur in both England and Scotland.

20 Somerset West and Taunton (2020). Local Plan review 2040. (Online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/somerset-local-plan/somerset-west-and-taunton-local-plan-2040-review/

21 Sedgemoor District Council (2019). Local Plan 2011-2032. Accessible at: Sedgemoor Local Plan [Accessed August 2024]

Table 8-3 - Technical Guidance relevant to terrestrial biodiversity and ornithology

Technical Guidance	Context
Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1[22]	Good practice guidance on Ecological Impact Assessment (EcIA).
Environmental Impact Assessment – Guide to Delivering Quality Development[23]	Good practice guidance on the EIA process.
Guidelines for Baseline Ecological Assessment[24]	Guidance on baseline ecological assessment.
Guidelines for Preliminary Ecological Appraisal, 2nd edition[25]	Good practice guidance on preliminary ecological appraisal.
British Standard (BS) 42020:2013, Biodiversity. Code of practice for planning and development[26]	Guidance to ensure that actions and decisions taken at each stage of the planning process are informed by sufficient and appropriate ecological information.
Handbook for Phase 1 Habitat Survey - A technique for environmental audit[27]	Good practice guidance on Phase 1 Habitat surveys.
A Review of Disturbance Distances in Selected Bird Species[28]	Guidance on thresholds of disturbance of certain bird species.
Bird Monitoring Methods[29]	Good practice guidance on bird survey / monitoring methods.
Bat Surveys for Professional Ecologists: Good Practice Guidelines[30] [31]	Guidance on bat ecology and good practice survey methods and standards.

[22] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester.
[23] Institute of Environmental Management and Assessment. (2016). Environmental Impact Assessment – Guide to Delivering Quality Development. IEMA; Lincoln, UK
[24] Institute of Environmental Assessment. (1995). Guidelines for Baseline Ecological Assessment. E & FN Spon; London, UK
[25] Chartered Institute of Ecology and Environmental Management. (2017). Guidelines for Preliminary Ecological Appraisal, 2nd edition. CIEEM; Winchester, UK.
[26] British Standards Institution. (2013). Biodiversity - Code of practice for planning and development. BSI; London, UK.
[27] Joint Nature Conservation Committee (JNCC). (2010). Handbook for Phase 1 Habitat Survey - a technique for environmental audit. JNCC; Peterborough, UK.
[28] Ruddock, M and Whitfield, DP. (2007). A Review of Disturbance Distances in Selected Bird Species. Natural Research (Projects) Ltd; Banchory, UK:
[29] Gilbert, G, Gibbons, D W and Evans, J (1998). Bird Monitoring Methods. Pelagic Publishing Ltd; Exeter, UK.
[30] Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edition). Bat Conservation Trust; London, UK.
[31] Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edition). The Bat Conservation Trust, London. ISBN-978-1-7395126-0-6

Technical Guidance	Context
Inverness badger survey 2003[32]	Guidance / information on badger surveys and types of badger sett.
FCS Guidance Note 35c: Forest operations and otters in Scotland[33]	Describes measures that forest, and woodland managers should follow to avoid or minimise the risk of committing offences relating to otters.
Standing advice for planning consultations – Otters[34]	Advice to applicants seeking permission for development that could affect otters (including survey recommendations), and to assist planning officers and other regulators in their assessment of these applications.
Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. *10*[35]	Includes guidance / information on otter surveys.
Great crested newt mitigation guidelines[36]	Guidance on great crested newt ecology and good practice survey methods and standards.
Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA[37]	Guidance on great crested newt good practice survey methods and standards.
Water Vole Conservation Handbook[38]	Includes guidance/information on water vole ecology and surveys.
Reptile survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation[39]	Includes guidance/information on reptile ecology/ surveys.

[32] Scottish Natural Heritage (Agency) (2005), Inverness badger survey 2003. Scottish Natural Heritage; Edinburgh, UK.

[33] Scottish Forestry. (2009). FCS Guidance Note 35c: Forest operations and otters in Scotland. (Online). Available at: https://forestry.gov.scot/publications/35-forest-operations-and-otters-in-scotland. (Accessed August 2024)

[34] NatureScot (2020). Standing advice for planning consultations – Otters. (Online). Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-otters#:~:text=If%20otters%20are%20breeding%2C%20the,exclusion%20zone%20should%20be%2030m. (Accessed August 2024).

[35] Chanin, P (2003). Monitoring the Otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature; Peterborough, UK

[36] English Nature (2001). Great crested newt mitigation guidelines. English Nature; Peterborough, UK:

[37] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA. Freshwater Habitats Trust; Oxford. UK.

[38] Strachan, R, Moorhouse, T and Gelling, M (2011), Water vole conservation handbook third edition. WildCru; Oxford, UK.

[39] Froglife. (1999). Reptile survey. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation Froglife Advice Sheet 10. Froglife; Halesworth, UK.

Technical Guidance	Context
Herpetofauna workers' manual[40]	Includes guidance/information on reptile ecology and surveys.

8.3 Data gathering methodology

Study Area

8.3.1. The Study Area encompasses the area over which all desk-based and field data were gathered to inform the assessment. Due to the presence of multiple ecological features and different potential effects, the level and type of data collection varies across the Study Area. The Study Area comprises:

The land inside the Hinkley Point B (HPB) Nuclear Site Licence (NSL) boundary ('the Site') and the 'Works Area' as indicated on **Figure 8.1**;

The desk Study Areas for sites designated for biodiversity conservation at international, European[41], national and local levels;

The desk Study Area for legally protected species (and legally controlled species) and other ecological features that are of notable importance for biodiversity conservation; and

The Survey Area, including the Site, the Works Area and perimeter areas.

8.3.2. The different components of the Study Area and Survey Area are summarised in **Table 8-4** and **Table 8-5**, and detailed further alongside the biodiversity baseline in **Section 8.5**, including supporting figures and appendices.

8.3.3. The Study Area was determined based on good practice guidance (see **Table 8-3**), the types of ecological features known to be present, and the potential effects that could occur. The Study Area was defined on a precautionary basis to ensure that, as a minimum, the Zone of Influence (ZoI)[42] of the Proposed Works that is relevant to all ecological features was covered during baseline data collection.

8.3.4. In defining the Study Area, the mobility and dispersal behaviour of different species and species groups is taken into account, as well as the likely extent of the environmental impacts resulting from the Proposed Works.

8.3.5. The temporal scope of the assessment of effects on terrestrial biodiversity and ornithology is consistent with the period over which the Proposed Works would be carried out and therefore covers the decommissioning period (**Chapter 2: The Decommissioning process**).

[40] Griffiths, R and Inns, H. (1998). Herpetofauna Workers' Manual. Joint Nature Conservation Committee; London, UK.

[41] The term 'European Site' refers to biodiversity conservation sites designated under the European nature directives, differentiating them for sites designated at a national level (e.g. SSSIs). In the UK European Sites now form part of the National Site Network.

[42] The zone of influence is the area within which a likely significant effect associated with the Proposed Works may be identified for a particular ecological feature.

Desk study

8.3.6. The desk-based study of ecological features that are known to occur or have previously been recorded within the Site, Works Area and surrounding areas is set out in detail in a separate desk study report[43] (**Appendix 8A**). Additional desk-based study of ornithological features is included together with the bird survey data in a separate report[44]. The desk study data sources and desk Study Areas are summarised in **Table 8-4**.

Table 8-4 - Desk study data

Ecological feature	Data	Sources	Desk Study Areas
Statutory biodiversity conservation sites	Site locations / boundaries; citations; and supporting information.	MAGIC[45], Joint Nature Conservation Committee (JNCC) website[46] and Natural England website[47]	Sites within 10 km. Sites designated for seabirds within 20 km, extended to 200 km for highly mobile seabirds.
Non-statutory biodiversity conservation sites	Site locations / boundaries; citations; and supporting information.	Somerset Environmental Records Centre (SERC), covering a ten-year period (2012 - 2022)[48]	Sites within 3 km.
Habitats (Habitats of Principal Importance for biodiversity conservation[49]; and Ancient Woodland[50])	Locations and boundaries	MAGIC[45]	Habitats within 3 km
Water bodies	Locations and boundaries	Aerial imagery[51] and 1:25,000 scale OS mapping	Water bodies within 0.5 km.
Legally protected species **Species of Principal Importance for biodiversity conservation (SPI)[49]**	Locations of species records:	Somerset Environmental Records Centre (SERC) MAGIC[45] HPB Integrated Land Management Plan[56] (ILMP).	Species records within 3 km (extended to 5 km for bat roosts and locations that are subject to European

[43] WSP (2023). Hinkley Point B Decommissioning EIA - Baseline Report: Desk Study (Terrestrial Biodiversity).
[44] Wood (2020). Hinkley Point B Decommissioning EIA - Baseline Report: Breeding and Non-breeding Birds.
[45] Defra (2022). Multi Agency Geographical Information for the Countryside (MAGIC). Magic Map: Interactive Map. (online) Available at: http://www.natureonthemap.naturalengland.org.uk/ (Accessed August 2024).
[46] JNCC (2023) website (online) Available at: https://jncc.gov.uk/our-work (Accessed August 2024)
[47] Natural England (2022). Designated sites view (online) Available at: https://designatedsites.naturalengland.org.uk/SiteSearch.aspx (Accessed August 2024),
[48] This data review focuses on the most recent ten-year period, avoiding reliance on historic records that could risk misrepresentation of the baseline.
[49] Defra and Natural England (2022). Habitats and species of principal importance in England (online). Available at: https://www.gov.uk/government/publications/habitats-and-species-of-principal-importance-in-england (Accessed August 2024).
[50] Ancient woodland is land that has been continually wooded since at least 1750.
[51] Microsoft (2019). Bing Maps (online) Available at: http://www.bing.com/maps (Accessed August 2024).
[56] EDF Energy Nuclear Generation Ltd (2018) Hinkley Point B Integrated Land Management Plan.

Ecological feature	Data	Sources	Desk Study Areas
Birds of Conservation Concern (BoCC) (Stanbury et al 2021[52]) **Species listed in the Local Biodiversity Action Plan (LBAP)[53] and/or Somerset Notable Species Dictionary[54]** **Legally controlled species[55]**		HPB Land Management Annual Reviews[57] (LMARs).	Protected Species Licences).
Birds (additional species records and monitoring data)	Locations of species records and monitoring data	Wetland Bird Survey (WeBS) data[58] Seabird Monitoring Programme (SMP) Database[59]	British Trust for Ornithology (BTO) WeBS monitoring sectors within the Severn Estuary. Seabird colonies within 10 km.

Survey work

8.3.7. A suite of biodiversity surveys (the 'Baseline Surveys') was carried out between spring 2019 and spring 2020. This included habitat surveys and surveys of a range of taxa, including otter (*Lutra lutra*) and water vole (*Arvicola amphibius*), badger (*Meles meles*), bats, birds, great crested newt (*Triturus cristatus*), reptiles and invertebrates. These surveys are detailed in separate baseline reports (**Appendix 8B** to **8I**, with subsequent updates and additional information in **Appendix 8J** and **8K**) as summarised in **Table 8-5**.

8.3.8. A habitat survey of the Site and Works Area, plus a 50 m perimeter around the Works Area, was completed in 2022, updating the previous habitat survey and extending the Survey Area to reflect minor iteration of the Works Area boundary. This survey is detailed in **Appendix 8J**. The survey also updated the assessment of bat roost suitability of built structures within the Site and Works Area.

Table 8-5 - Terrestrial biodiversity and ornithology surveys

[52] Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021) Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. British Birds Volume: 114

[53] Biodiversity South West (2022). LBAPs (online). Available at: http://www.biodiversitysouthwest.org.uk/link_lbap.html (Accessed August 2024). Local BAP priority species were identified by SERC.

[54] SERC (2000). Somerset Notable Species Dictionary. Fifth Edition. Available at: www.somerc.com/local-wildlife-sites/somerset-notables-dictionary (Accessed August 2024).

[55] Non-native species listed in Schedule 9 (parts 1 and 2) of the Wildlife and Countryside Act 1981 (as amended) and includes animals and plants which may not be released or allowed to escape into the wild.

[57] EDF Energy Nuclear Generation Ltd (2014 to 2022). Hinkley Point B Land Management Annual Review.

[58] Frost, T.M., Calbrade, N.A., Birtles, G.A., Mellan, H.J., Hall, C., Robinson, A.E., Wotton, S.R., Balmer, D.E. and Austin, G.E. (2020). Waterbirds in the UK 2018/19: The Wetland Bird Survey. BTO/RSPB/JNCC; Thetford, UK

[59] JNCC (2020). Seabird Monitoring Programme (online) Available at: https://app.bto.org/seabirds/public/index.jsp (Accessed August 2024).

Ecological feature	Scope of survey	Study Area	Survey period	Survey report
Habitats	Habitat survey	Site and Works Area, including a perimeter of at least 50 m around the Works Area.	June 2019 (update in August 2022)	**Appendix 8B** (update in **Appendix 8J**)
Otter and water vole	Otter and water vole survey	Site, plus a 250 m perimeter.	July 2019	**Appendix 8C**
Badger	Badger survey	Site, plus a 250 m perimeter.	August 2019	**Appendix 8D**
Bats (roosts)	Preliminary bat roost assessment (PRA). Survey of potential bat roosts Survey of potential hibernation roosts	The Site and Works Area, plus a 50 m (minimum) perimeter.	May 2019, with updates in July 2020 (trees) and August 2022 (built structures). July – Sept 2019, with updates August to October 2020 (trees); and May/June 2023 (new building). November 2019 to February 2020	**Appendix 8E** (additional information in **Appendix 8J** and **8K).**
Bat (activity)	Bat activity survey	The Site, plus adjacent areas of Hinkley LWS.	May – October 2019	**Appendix 8E**
Birds (breeding)	Breeding bird survey	The Site, plus adjacent areas of Hinkley LWS.	April to July 2019	**Appendix 8F**
Birds (non-breeding)	Non-breeding bird survey, including disturbance monitoring.	The Site plus a 500 m perimeter.	September 2019 to March 2020.	**Appendix 8F**
Great crested newt	Great crested newt presence/ absence survey	The Site plus a 500 m perimeter	May 2019	**Appendix 8G**
Reptiles	Reptile survey	The Site plus a 100 m perimeter	June to September 2019	**Appendix 8H**
Invertebrates	Invertebrate survey	The Site	August and September 2019	**Appendix 8I**

Data limitations

8.3.9. Survey constraints are addressed separately in the accompanying reports (**Appendix 8A** to **Appendix 8K**). The constraints are minor and likely to have negligible influence on the characterisation of the baseline status of ecological features and the assessment of the effects of the Proposed Works on biodiversity.

8.3.10. A period of over three years has elapsed since the completion of the 2019 Baseline Surveys. The habitat survey completed in 2019 was therefore updated in 2022. The purpose of the survey update, referred to as *'Baseline Verification'*, was to determine whether the terrestrial biodiversity baseline, derived by the previous survey work and desk-based study, remains valid to inform the assessment.

8.3.11. Baseline Verification is reported separately (**Appendix 8J**) and concludes that there have been no substantive changes in the baseline status of terrestrial habitats within the Site and Works Area.

8.3.12. The desk-based study was also updated in 2022 (**Appendix 8A**) and included a review of HPB Land Management Annual Reviews (LMARs) up to 2021, which report annual biodiversity monitoring that is carried out to assess progress against the HPB Integrated Land Management Plan. This work, and the more recent monitoring reported in the 2022 LMAR, has also not detected any shift in the biodiversity baseline.

8.3.13. Subsequent to baseline data collection, there has been limited refinement to the Works Area boundary to include a sewage treatment works and the intake and outfall infrastructure. The latter is marine infrastructure that extends the Works Area further into Bridgwater Bay to the north. The Site boundary has not changed, and the terrestrial element of the Works Area has been substantively reduced to exclude electricity substation infrastructure to the south (see **Figure 8.1**). These adjustments to the Works Area are therefore likely to have had a negligible influence on the characterisation of terrestrial biodiversity baseline.

8.3.14. It is concluded therefore that there are likely to have been no substantive changes in baseline status of species populations at HPB since the Baseline Surveys were completed in 2019 and 2020. The characterisation of the biodiversity baseline, reported in the Baseline Reports, is therefore also concluded to remain valid.

8.4 Consultation

Pre-application Opinion

8.4.1. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the assessment of effects on terrestrial biodiversity and ornithology and confirmation of how these are addressed by the assessment is included in **Table 8-6**.

Table 8-6 - Summary of Pre-application Opinion Responses

Paragraph Ref	Consideration	How addressed in the ES
46	**There is no mention of the Biodiversity Benchmark from the Wildlife Trusts that is held by Hinkley Point B. This is a useful**	The biodiversity benchmark certification, and associated annual biodiversity monitoring reported in the LMARs, is referenced as part of the baseline

Paragraph Ref	Consideration	How addressed in the ES
	source of biodiversity information, and the station management system is subject to external audits by the Wildlife Trust so it may be beneficial for this to be referenced in the ES.	(**Section 8.5**) and baseline verification (**Section 8.3**).
Appendix 2, Table row 3	Feedback examples • In Chapter 7 (Climate Change), the desk Study Area is defined as extending 200 km from the Site to include marine statutory biodiversity sites with ornithological interest, however, Table 7.4 (terrestrial and freshwater biodiversity baseline) does not include the Carmarthen Bay SPA and Burry Inlet SPA and Ramsar site which are within the Study Area.	The desk study extends to 200 km only for European Sites that are designated for highly mobile seabirds, e.g. those reliant on foraging grounds that extend over very long distances, and which could therefore come into contact with the HPB ZoI. There are two such designations/sites: Skokholm and Skomer SPA; and Grassholm SPA. The qualifying species of both sites primarily forage well beyond the marine elements of HPB and both sites are therefore scoped-out of the assessment (**Section 8.9**).
Appendix 2, Table row 4	In Chapter 7 (Climate Change), within **Section 7.5**, the scale of the value or sensitivity of receptors has not been defined. A sensitivity value (high, medium, low) has not been clearly concluded and definitions of the scale should have been provided in **Section 7.5**.	In summarising the effects of the Proposed Works on ecological features the emphasis is primarily on the biodiversity conservation '*importance*' of the feature and the predicted magnitude of effect on its conservation status, in accordance with good practice (CIEEM 2018[1]). Although the term 'sensitivity' is not necessarily used, consideration of the sensitivity of each ecological feature to the effects of the Proposed Works is inherent to the assessment method (**Section 8.7**).
Appendix 2, Table row 10	Chapter 7 (Climate Change) covers impacts on birds, however, in table 7.8, activities that could affect the marine environment and thus have an indirect effect to birds have not been considered. For example, underwater noise effects, and changes to water quality such as contamination from the disturbance of sediments, which could lead to impacts to fish populations. Sufficient evidence to support the scoping exercise has not been provided at this stage.	Consideration of effects on marine biodiversity (including intertidal habitats, subtidal habitats, fish and marine mammals) are addressed in Chapter 9 Marine Biodiversity and the associated effects on birds are assessed in this chapter. Effects on diving birds are however scoped-out of the assessment (**Section 8.9**).

Non-statutory consultation

8.4.2. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

8.4.3. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following

receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

8.4.4. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. Comments relevant to the terrestrial biodiversity and ornithology assessment are summarised in **Table 8-7**.

Table 8-7 - Comments received during non-statutory consultation relevant to the terrestrial biodiversity and ornithology assessment

Respondent	Comment received	Response from the Applicant
Round 1 consultation		
No comments were received during the Round 1 consultation relevant to the terrestrial biodiversity and ornithology assessment.		
Round 2 consultation		
Somerset Council	Request to ensure that any works do not bring any harm to any of the wildlife features within the wildlife designation zones.	This chapter sets out the assessment of the effects of the Proposed Works on terrestrial biodiversity and ornithology, including effects on designated biodiversity conservation sites/areas.
Somerset Council	Reminder that a 10% minimum provision of Biodiversity Net Gain will be required by law for various works of either demolition of existing structures, building new facilities or cladding of existing buildings.	This is noted. The biodiversity units within the Works Area have been calculated using the biodiversity metric for calculating Biodiversity Net Gain (BNG). The metric is used to determine the anticipated loss of biodiversity units to the Proposed Works and preliminary calculations of the BNG baseline are appended (**Appendix 8L**). At this time, BNG is not required under EIADR. However, the requirement for BNG will be kept under review by the Applicant (and future Site Licensee).

Technical engagement

8.4.6. **Table 8-8** summarises the technical engagement that has been undertaken in relation to the terrestrial biodiversity and ornithology assessment.

Table 8-8 - Terrestrial biodiversity and ornithology surveys

Stakeholder	Meeting date	Points discussed
Somerset County Council (SCC)[60]	22 June 2021[61]	Based on the results of the extended Phase 1 Habitat Survey at HPB in 2019, it is concluded that National Vegetation Classification (NVC) surveys are not necessary. Butterfly monitoring has been undertaken routinely at Hinkley LWS as part of the HPB LMARs and therefore further butterfly surveys are not planned. Loss or disturbance of habitats within Hinkley LWS could have associated effects on moths, with a possible requirement for baseline moth surveys. Further definition of the Works Area however means that there will be negligible loss or disturbance of habitat within the LWS and therefore no further invertebrate surveys are planned. Baseline biodiversity data was collected at HPB during the 2019 and 2020 survey seasons and a further walkover survey of the Works Area is required to verify that the baseline remains valid[62].
Somerset Council	12 June 2024	Overview of the terrestrial biodiversity and ornithology assessment and its interim assessment findings.
Environment Agency	11 July 2024	Overview of the terrestrial biodiversity and ornithology assessment and its interim assessment findings.
Natural England	18 July 2024	Overview of the terrestrial biodiversity and ornithology assessment and its interim assessment findings.

[60] Somerset Unitary Authority was created in April 2023 and replaces Somerset County Council. The new unitary council brings together the services previously provided by the four district councils in Somerset (Mendip, Sedgemoor, Somerset West and Taunton, and South Somerset) alongside the services formerly provided by Somerset County Council. Where text refers to Somerset County Council, these discussions occurred prior to April 2023.

[61] Notes of meeting - Decommissioning Hinkley Point B. Meeting held via conference call (MS Teams) on 22 June 2021 and attended by Somerset County Council, EDF Energy and WSP UK Ltd (formerly Wood Group UK Ltd).

[62] The desk study was updated in 2022 (**Appendix 8A**) and a further habitat survey of the Site and Works Area was completed in August 2022 to review any changes to habitats within this area that could have had substantive influence on the biodiversity baseline. This is referred to as Baseline Verification (**Appendix 8J**).

8.5 Overall baseline

The Site and its Surrounds

8.5.1. The Site and Works Area are on the coast of Bridgwater Bay at the mouth of the River Severn and on the southern flank of the Bristol Channel. The majority of the Works Area comprises built structures and hard standing (mainly access and car parks). To the south and east of the Works Area there is a fringe of woodland and scrub, with areas of open grassland. Hinkley Point A (HPA) borders the Works Area to the west and further west beyond a small area of woodland is the Hinkley Point C (HPC) development. The wider landscape to the south and east is agricultural. Bridgwater Bay is to the north.

8.5.2. The majority of the non-operational land within the Site is designated as Hinkley Local Wildlife Site (LWS), with part of the LWS to the west of the Site having been removed within to the footprint of the HPC development. The areas of the LWS within the Site and Works Area are currently managed for biodiversity conservation in accordance with the Nuclear Generation Biodiversity Action Plan and HPB Integrated Land Management Plan. Progress towards achieving management objectives is reviewed annually and reported in LMARS. In recognition of this commitment to biodiversity conservation, the HPB Site is certified under the Wildlife Trusts' Biodiversity Benchmark[63].

Biodiversity Conservation Sites

8.5.3. There are nine statutory biodiversity conservation designations within 10 km of the Site and Works Area, including four European Sites (including Ramsar sites), four SSSIs and one National Nature Reserve (NNR). There is a further SPA and Ramsar site within 20 km. These sites are summarised in **Table 8-9** (european designations) and **Table 8-10** (national designations) and shown on **Figure 8.2** and **Figure 8.3**.

8.5.4. There are other SPAs within 200 km of the Site that have marine seabird qualifying features:

- Skokholm and Skomer SPA is approximately 127 km to the north-west. The foraging range of one qualifying feature (breeding manx shearwater, *Puffinus puffinus*) overlap the Study Area; and
- Grassholm SPA is approximately 170 km to the north-west. The foraging range of one qualifying feature (breeding gannet, *Morus bassanus*) overlaps the Study Area.

8.5.5. Although the foraging range of qualifying features/species of both sites overlap the Study Area, these species primarily forage in the wider offshore environment, outside of the HPB marine infrastructure footprint.

[63] The Wildlife Trusts' Biodiversity Benchmark certifies the management of a business site for wildlife. It tests the design and implementation of a business's management systems to achieve continual biodiversity enhancement and protection on their sites. Further details are online: https://www.wildlifetrusts.org/partnerships/working-businesses/biodiversity-benchmark. (Accessed August 2024)

Table 8-9 - Statutory biodiversity conservation sites (international designations)

Designation	Reason for site selection & qualifying features	Proximity to Site (Works Area)*
Severn Estuary SAC	Annex I habitats that are a primary reason for site selection: ▪ Estuaries. ▪ Mudflats and sandflats not covered by seawater at low tide. ▪ Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*). ▪ Annex I habitats present as a qualifying feature, but not a primary reason for site selection: ▪ Sandbanks which are slightly covered by sea water all the time. ▪ Reefs. ▪ Annex II species that are a primary reason for site selection: ▪ Sea lamprey (*Petromyzon marinus*). ▪ River lamprey (*Lampetra fluviatilis*). ▪ Twaite shad (*Alosa fallax*).	Works Area extends into the SAC.
Severn Estuary SPA	ARTICLE 4.1 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Bewick's swan (*Cygnus columbianus bewickii*) (Western Siberia/North-eastern & North-western Europe) 3.9% of the GB population (5-year peak mean 1991/92-1995/96). ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: Gadwall (*Anas Strepera*) (North-western Europe) 0.9% of the population (5-year peak mean 1991/92-1995/96). White-fronted goose (*Anser albifrons albifrons*) (North-western Siberia/North-eastern & North-western Europe) 0.4% of the population (5-year peak mean 1991/92-1995/96). Dunlin (*Calidris alpina alpine*) (Northern Siberia/Europe/Western Africa) 3.3% of the population 5-year peak mean 1991/92-1995/96. Shelduck (*Tadorna tadorna*) (North-western Europe) 1.1% of the population 5-year peak mean 1991/92-1995/96.	Works Area extends into the SPA.

Designation	Reason for site selection & qualifying features	Proximity to Site (Works Area)*
	Redshank (*Tringa totanus*) (Eastern Atlantic – wintering) 1.3% of the population 5-year peak mean 1991/92-1995/96. ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 84,317 waterfowl (5-year peak mean 1991/92-1995/96), including: Bewick's swan, shelduck, gadwall, dunlin and redshank.	
Severn Estuary Ramsar	**Ramsar criterion 1** Contains the second largest tidal range which affects the physical environment and biological communities. Also contains the following Habitats Directive Annex I features: H1110 – Sandbanks which are slightly covered by sea water all the time. H1130 – Estuaries. H1140 – Mudflats and sandflats not covered by seawater at low tide. H1330 – Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*). **Ramsar criterion 3** Due to unusual estuarine communities with reduced diversity and high productivity. **Ramsar criterion 4** This site is important for the run of migratory fish between the sea and river estuary. Species include salmon (*Salmo salar*), sea trout (*Salmo trutta*), twaite shad and eel (*Anguilla anguilla*). It is also of particular importance for migratory birds during spring and autumn. **Ramsar criterion 5** Assemblages of international importance, with large peak counts of waterfowl in winter. **Ramsar criterion 6** Species/populations occurring at levels of international importance. These include the tundra swan (Bewick's swan), greater white-fronted goose, common shelduck, gadwall, dunlin and common redshank. Some species have been identified subsequent to designation for possible future designation under criterion 6. **Ramsar criterion 8** Over 110 species of fish have been recorded within the estuarine and river system making this one of the most diverse in Britain. Some of these species include salmon, sea trout, sea lamprey, river lamprey and allis shad (*Alosa alosa*). The Severn Estuary is a key migration route to their	Works Area extends into the Ramsar site.

Designation	Reason for site selection & qualifying features	Proximity to Site (Works Area)*
	spawning grounds and is also an important feeding and nursery ground for many fish species.	
Exmoor and Quantock Oakwoods SAC	Annex I habitats that are a primary reason for site selection: ▪ H91A0. Old sessile oak (Quercus petraea) woods with Ilex and Blechnum in the British Isles. ▪ Annex I habitats present as a qualifying feature, but not a primary reason for site selection: ▪ H91E0. Alluvial forests with Black alder (Alnus glutinosa) and European ash (Fraxinus excelsior) (Alno-Padion, Alnion incanae, Salicion albae). ▪ Annex II species that are a primary reason for site selection: ▪ 1308 Barbastelle (*Barbastella barbastellus*) – a maternity colony of barbastelles utilises a range of tree roosts in this area of predominantly oak (*Quercus* spp.) woodland. ▪ Annex II species that are qualifying features and not a primary reason for site selection: ▪ S1355, Otter (*Lutra lutra*). ▪ S1323, Bechstein's bat (*Myotis bechsteinii*).	6.6 km south-west (6.9 km south-west).
Somerset Levels and Moors SPA	ARTICLE 4.1 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: ▪ Bewick's swan (*Cygnus columbianus bewickii*) (Western Siberia/North-eastern & North-western Europe). 2.7% of the GB population (5 year peak mean 1991/92-1995/96). ▪ Golden plover (Pluvialis apricaria) (North-western Europe – breeding) 1.2% of the GB population (5 year peak mean 1991/92-1995/96). ▪ ARTICLE 4.2 QUALIFICATION (79/409/EEC) ▪ Over winter the area regularly supports: ▪ Teal (*Anas crecca*) (North-western Europe) 3.3% of the population (5 year peak mean 1991/92-1995/96). ▪ Lapwing (*Vanellus vanellus*) (Europe - breeding) 0.5% of the population (5 year peak mean 991/92-1995/96. ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS	15.8 km east (15.9 km east).

Designation	Reason for site selection & qualifying features	Proximity to Site (Works Area)*
	Over winter the area regularly supports: 73,014 waterfowl (5 year peak mean 1991/92-1995/96) Including: Bewicks swan, teal, golden plover and lapwing.	
Somerset Levels and Moors Ramsar	Ramsar criterion 5 - Assemblages of international importance Species with peak counts in winter: ▪ 97,155 waterfowl (5 year peak mean 1998/99-2002/2003). ▪ Ramsar criterion 6 - Species/populations occurring at levels of international importance ▪ Species with peak counts in winter: ▪ Teal. ▪ Lapwing. ▪ Species/populations identified subsequent to designation for possible future consideration under criterion 6. ▪ Species with peak counts in winter: ▪ Eurasian wigeon (*Anas Penelope*). ▪ Mute swan (*Cygnus olor*). ▪ Northern pintail (*Anas acuta*). ▪ Northern shoveler (*Anas clypeata*).	15.8 km east (15.9 km east).

* Distances are approximate.

Table 8-10 - Statutory biodiversity conservation sites (national designations)

Designation	Reasons for site notification/designation	Proximity to the Site (Works Area)*
Berrow Dunes SSSI	This site covers a wide range of coastal habitats which includes salt marsh, fore, grey and yellow dunes, stable dune grassland, dune slacks, scrub and a freshwater lagoon. It supports one of the most diverse floras in Somerset with 272 species of flowering plant. It is also locally important for breeding and wintering birds.	9.1 km north-east (8.8 km north-east).

Designation	Reasons for site notification/designation	Proximity to the Site (Works Area)*
Bridgwater Bay SSSI	A succession of habitats including extensive intertidal mudflats, saltmarsh, shingle beach and grazing marsh intersected by a complex network of freshwater and brackish ditches. It supports internationally and nationally important numbers of over-wintering and passage migrant waders and waterfowl. The site supports a diverse invertebrate fauna including Red Data Book (RDB) species and nationally rare and nationally scarce species. The site also supports uncommon and nationally restricted macrophytes. The Site contains the most extensive area of saltmarsh in Somerset and one of the largest common cord-grass (*Spartina anglica*) swards in the Severn Estuary. The habitats on the landward side include grazing marsh and semi-improved neutral grassland.	0 km (Works Area extends into SSSI).
The Quantocks SSSI	Contains a wide variety of habitats including dwarf-shrub heath, wet dwarf-shrub heath, acidic flushes, ancient semi-natural broadleaved woodland and dense scrub. This supports a rich plant, lichen and bird fauna.	6.3 km south-west (6.6 km south-west.
Ge-Mare Farm Fields SSSI	An unimproved species-rich flood pasture community with interest enhanced by the presence of a wetter area supporting a lowland mire community. Herb species characteristic of unimproved wet grassland are frequent.	6.2 km south-west (6.5 km south-west.
Somerset Wetlands NNR	A newly merged Site consisting of the former Bridgwater Bay, Ham Wall, Huntspill River, Shapwick Heath, Somerset Levels and Westhay Moor NNRs. Bridgwater Bay is one of the largest areas of intertidal mudflats in Britain, and as such is an internationally important feeding and roosting site for many waterfowl and wading birds. It also contains the largest area of saltmarsh in Somerset. Other main habitats include sandflats and shingle ridges.	0 m (Works Area extends into the NNR).

* Distances are approximate

Biodiversity Conservation Sites (non-statutory)

8.5.6. There are nine LWS within 3 km of the Site (see **Table 8-11** and **Figure 8.4**), four of which incorporate or overlap Ancient Woodland Inventory (AWI) sites.

Table 8-11 - Non-statutory biodiversity conservation sites

LWS name	Description	Proximity to Site (Works Area)*
Blue Anchor to Lilstock Cliff	Coastal cliffs, with unimproved calcareous grassland and scrub habitats from Blue Anchor to Lilstock.	1.4 km west (1.7 km west).
Cole Pool Field	Field with unimproved neutral and marshy grassland and semi-improved grassland areas.	2.2 km south-west (2.5 km south-west).
Fairfield House Park	Parkland site as marked on the 1st edition OS map with an important assemblage of Veteran Trees.	3 km south-west (3.3 km south-west).
Hinkley	Species-rich scrub, coastal grassland and broadleaved woodland with ponds and areas of improved grassland. The Applicant manages the Hinkley LWS for biodiversity conservation. This LWS wraps around the area south of the double security fence. Limited parts of the Works Area therefore lie within the Hinkley LWS. The mapped extent of Hinkley LWS does not take in to account the loss of part of this area to the west of the Site, which is within the footprint of the Hinkley Point C (HPC) development.	0 m (Works Area extends into the LWS).
Honibere Wood	A large tract of hedged, embanked and ditched ancient semi-natural woodland occupying very wet-lying ground on the coastal strip north of Stringston. AWI site.	2.6 km south-west (3 km south-west).
Martin's Wood	A generally square tract of ancient semi-natural woodland, hedged, ditched and embanked all round, with a small stream flowing eastwards along its southern edge. AWI site.	2.9 km south-west (3.2 km south-west).
Monk Wood	Ancient semi-natural broadleaved woodland. AWI site.	2.3 km south (2.5 km south).
Mud House Copse	Ancient semi-natural broadleaved woodland.	1.7 km south-east (1.7 km south).
Wick Park Covert	Ancient semi-natural broadleaved woodland bisected by a road. Overlaps AWI site (two adjacent areas).	1.8 km south-east (1.9 km south-east).

* Distances are approximate

Habitats

8.5.7. Habitat types that qualify or potentially qualify[64] as Habitats of Principal Importance for Biodiversity Conservation that have previously been recorded within 3 km of the Site are summarised in the desk study report (**Appendix 8A**). These habitats include coastal saltmarsh, coastal vegetated shingle, intertidal mudflats, lowland calcareous grassland, lowland meadow, good quality semi-improved grassland, purple moor-grass and rush pasture, saline lagoons, traditional orchard, deciduous woodland; maritime cliff and slope, coastal and floodplain grazing marsh and open mosaic habitat. Records of the latter four habitat types are within or border the Site boundary and/or Works Area. Areas of ancient woodland within 3 km of the Site coincide with LWS as summarised separately above.

8.5.8. The habitat survey is also detailed in a separate baseline report (**Appendix 8B**), which has been updated by way of baseline verification (**Appendix 8J**). The habitats within the Survey Area are marked on **Figure 8.5** and summarised in **Table 8-12**

Table 8-12 - Summary of Biodiversity Baseline: Habitats

Habitats	Summary
Broadleaved semi-natural woodland	Two areas of broad-leaved plantation woodland within the western limit of the Site, containing occasional mature ash (*Fraxinus excelsior*) and oak (Quercus sp.), amongst an even-aged canopy of the same species. The understorey is sparse, with hazel (*Corylus avellana*), elder (*Sambucus nigra*), privet (*Ligustrum vulgare*), holly (*Ilex aquifolium*), bramble (*Rubus fruticosus*) and elm (Ulmus sp.). The ground-flora is species-poor and dominated by ivy (*Hedera helix*), with common cleavers (*Galium aparine*), common nettle (*Urtica dioica*) and common fern species. The woodlands exhibit evidence of human intervention (planting, thinning etc.) and broadly correspond to a modified, species-poor and structurally poor W8 *Fraxinus excelsior - Acer campestre - Mercurialis perennis* woodland (Rodwell, 1992[65]), meeting the criteria for lowland mixed deciduous woodland, a Habitat of Principal Importance for biodiversity conservation.
Broadleaved plantation woodland	A tract of young broad-leaved plantation woodland inside the eastern boundary of the Site, in places extending along the edge of the Works Area. The canopy mainly comprises ash and sycamore (*Acer pseudoplatanus*), with oak also recorded. The understorey includes planted field maple (*Acer campestre*), bramble and rose (Rosa sp.), with the ground-flora comprising areas of bare ground, common nettle and ivy, with pendulous sedge (*Carex pendula*) and false wood-brome (*Brachypodium sylvaticum*) also recorded. There is a narrow, planted belt of English elm (*Ulmus procera*) along the south-west limit of the Site boundary.
Scattered trees	Three semi-mature sycamore trees within a small area of amenity grassland within the Works Area.

[64] The distribution/status of these habitats has not been subject to ground truth surveys and it is likely that some of these habitat areas will have changed or been lost, including two blocks of deciduous woodland to the west of the Site, which are within the footprint of the HPC development

[65] Rodwell, J.S. (1992). British Plant Communities Volume 1. Woodlands and scrub. Cambridge University Press, Cambridge.

Habitats	Summary
Dense continuous scrub	Substantial areas of dense scrub within the south and north-east of the Site, bordering the Works Area in places, with some of these areas having been planted. Some areas containing hawthorn (*Crataegus monogyna*), blackthorn (*Prunus spinosa*), dogwood (*Cornus sanguinea*), hazel and field maple are maturing to woodland. Grey willow (*Salix cinerea*), goat willow (*Salix caprea*), elder, rose and bramble occur as dense or scattered patches.
Semi-improved neutral grassland	Areas of semi-improved, neutral grassland within the east and south-west of the Site, in places bordering the Works Area. The grasslands are not species-poor; however, they are not likely to qualify as habitat of principal importance. The grassland is predominantly false oat-grass (*Arrhenatherum elatius*), red fescue (*Festuca rubra*) and perennial rye-grass (*Lolium perenne*), with soft brome (*Bromus hordeaceus*), meadow brome (*Bromus commutatus*), false wood-brome (*Brachypodium sylvaticum*), crested dog's-tail (*Cynosurus cristatus*), meadow foxtail (*Alopecurus pratensis*) and cock's-foot (*Dactylis glomerata*). Within the southern limit of the Site this habitat supports a range of forbs, including red clover (*Trifolium repens*), white clover (*Trifolium pratense*), common bird's-foot trefoil (*Lotus corniculatus*), ox-eye daisy (*Leucanthemum vulgare*), eyebright (Euphrasia sp.), common centaury (*Centaurium erythraea*), primrose (*Primula vulgaris*), red bartsia (*Odontites vernus*), yellow-wort (*Blackstonia perfoliata*), hairy violet (*Viola hirta*), hairy tare (*Vicia hirsuta*), smooth tare (*Vicia tetrasperma*), wild carrot (*Daucus carota*), wild parsnip (*Pastinaca sativa*), common knapweed (*Centaurea nigra*), pyramidal orchid (*Anacamptis pyramidalis*), common vetch (*Vicia sativa*), black medick (*Medicago lupulina*), lady's bedstraw (*Galium verum*), common broomrape (*Orobanche minor*) and grass vetchling (*Lathyrus nissolia*). The grassland extending around the southern limit of the Works Area (sewage works) supports a similar range of species, with limited grass and a particularly high cover of ox-eye daisy and abundant pyramidal orchid. Grassland bordering the Works Area to the south-east supports swards of Yorkshire fog (*Holcus lanatus*), Timothy (*Phleum pratense*), meadow foxtail and perennial rye-grass, with forbs including common vetch, cut-leaved crane's-bill (*Geranium dissectum*) and creeping buttercup (*Ranunculus repens*) grading into tall ruderal vegetation, such as hogweed (*Heracleum sphondylium*) and broad-leaved dock (*Rumex obtusifolius*), at boundary hedge bases. Grassland areas along/near the north-east boundary of the Site are moderately species-rich, supporting meadow brome, common bent (*Agrostis tenuis*), pyramidal orchid and grass vetchling, with patches of teasel (*Dipsacus fullonum*), common mallow (*Malva sylvestris*), creeping thistle (*Cirsium arvense*) and scattered bramble and rose scrub.
Tall ruderal	Large areas of tall ruderal vegetation, within the Site, outside the Works Area to the south and north-east, often in transition/mosaic with short ephemeral/short perennial vegetation, grassland and scrub. Abundant species include teasel, great willowherb (*Epilobium hirsutum*), tansy (*Tanacetum vulgare*), common nettle, weld (*Reseda luteola*), mugwort (*Artemisia vulgaris*), common ragwort (*Senecio Jacobaea*), agrimony (*Agrimony eupatoria*), spear thistle (*Cirsium vulgare*), creeping thistle, rosebay willowherb (*Chamerion angustifolium*) and bristly ox-tongue (*Picris echioides*).

Habitats	Summary
Swamp	An area of reedbed around a pond to the south of the Site, near the south-east limit of the Survey Area, with small patches of similar vegetation along a small ditch along the south-eastern boundary of the Site. Although reedbed is a habitat type that is of principal importance for biodiversity conservation, the extent of this habitat within the Survey Area is limited/localised and it does not occur within the Works Area.
Standing water	There is a small pond within the south-west of the Site, approximately 3 m in diameter, surrounded by mown amenity grassland and scattered scrub. It supports a range of marginal/emergent plant species, including pondweed (Potamogeton sp.), water mint (*Mentha aquatic*), marsh marigold (*Caltha palustris*) and arrowhead (*Sagittaria sagittifolia*). The latter is listed in the Somerset Notable Species Dictionary[66]. A larger (approximately 20m diameter) pond to the south of the Site's eastern boundary is fringed with common reed (*Phragmites australis*). Both/either of the two ponds potentially qualify as habitat of principal importance for biodiversity conservation, however both are outside of the Works Area. A narrow ditch that drains out of the south-eastern boundary of the site could not be safely accessed due to dense vegetation, however it is outside of the Works Area.
Coastal strandline vegetation	The coast of Bridgwater Bay, at the north-east boundary of the Site, is largely bare rock, with limited scattered plant species, including prickly sow-thistle (*Sonchus asper*), spear-leaved orache (*Atriplex prostrata*), sea couch (*Agropyron pungens*) and sea beet (*Beta vulgaris subsp. maritima*). The latter two species are listed in the Somerset Notable Species Dictionary.
Amenity grassland	There are small (i.e. less than 10m^2) areas of amenity grassland within the Site and Works Area. These are predominantly mown/rabbit-grazed turf, mainly comprising annual meadow-grass (*Poa annua*) and red fescue, with a range of common forbs including dove's-foot crane's-bill (*Geranium molle*), selfheal (*Prunella vulgaris*) and creeping buttercup.
Ephemeral/short perennial	There are areas of ephemeral/short perennial vegetation within the Site, amongst hardstanding/gravel, as well as areas that are in transition with tall ruderal vegetation and scrub. Species that are typical of these areas include selfheal, common centaury, scarlet pimpernel (*Anagallis arvensis*), yellow-wort and ground-ivy (*Glechoma hederacea*). Yellow-wort, bee orchid and pyramidal orchid were recorded throughout this habitat, at varying abundance and all three are listed in the Somerset Notable Species Dictionary. This habitat is outside of the Works Area.
Intact hedgerows	Two intact, species rich, hedgerows form the boundaries of a triangular field, bordered by a road/footpath, outside the southern-most extent of the Site. Woody species in the hedgerows include rose, blackthorn, hawthorn, field maple and dogwood, with a species-poor ground-flora including greater saxifrage (*Pimpinella major*), hedge woundwort (*Stachys sylvatica*), wood dock (*Rumex sanguineus*) and common cleavers. These hedgerows are likely to qualify as habitat of principal importance , potentially also meeting the criteria (ecology) to qualify as 'important' under The Hedgerows Regulations 1997. Both hedgerows are outside the Site and Works Area.

[66] SERC (2000). Somerset Notable Species Dictionary. Fifth Edition. Available at: www.somerc.com/local-wildlife-sites/somerset-notables-dictionary (Accessed January 2024).

Habitats	Summary
Sea wall	There is a concrete sea wall extending along the northern edge of the Site and Works Area. It is largely devoid of vegetation, however rock sea-lavender (Limonium sp.), buck's-horn plantain (*Plantago coronopus*) and occasional lesser sea-spurrey (*Spergularia marina*) occur in cracks and crevices in the concrete. All three are listed on the Somerset Notable Species Dictionary. Sub-species of sea lavender and rock sea-lavender are difficult to separate (Rose 2006[67]) and some populations of these species are of potentially notable biodiversity conservation importance.
Bare ground	There are areas of bare gravel and exposed substrate throughout the Works Area.

Species

8.5.9. The baseline status of species and species groups within the Study Area is summarised in **Table 8-13**.

Table 8-13 - Summary of Biodiversity Baseline: Species

Ecological feature/ survey	Survey/ data sources	Last surveyed	Baseline summary
Otter & Water vole	Desk Study (**Appendix 8A**) Otter and water vole survey (**Appendix 8C**) Baseline verification (**Appendix 8J**)	2019 (Baseline verification in 2022)	No evidence of otter activity was recorded within the Site or a 250 m perimeter area . There were however 33 records of otter within 3 km of the Site between 2012 and 2022 and it is likely that this species commutes through and/or forages within the Study Area in low numbers intermittently. No evidence of water vole activity was recorded within the Site or a 250 m perimeter area. The majority of waterbodies within this area are of low/negligible suitability for water vole, with banks lacking diverse macrophytes favoured by foraging water vole, plus widely fluctuating water levels in ditches. It is therefore likely that this species no longer occurs within this area, also recognising that the only water vole record within the wider Study Area between 2012 and 2022 was over 1.2 km from the Site in 2018.
Badger	Desk Study (**Appendix 8A**) Badger survey (**Appendix 8D**) Baseline verification (**Appendix 8J**)	2019 (Baseline verification in 2022)	The habitats within the Survey Area (the Site and 250 m perimeter area) are suitable for badgers (foraging, commuting and sett building), including dense continuous scrub, broadleaved semi-natural woodland, semi-improved grassland, poor semi-improved grassland, improved grassland (pasture) and tall ruderal vegetation. Badger activity within the Study Area is detailed in a separate confidential baseline report.

[67] Rose, F. (2006). The Wildflower Key. Penguin, London.

Ecological feature/ survey	Survey/ data sources	Last surveyed	Baseline summary
Bats	Desk Study (**Appendix 8A**) Bat surveys (**Appendix 8E**) Baseline Verification (**Appendix 8J**) Additional bat survey (**Appendix 8K**)	2019/ 2020 (Baseline verification in 2022). Survey of new building in 2023.	The land within the Works Area is of low suitability for bats, predominantly comprising hard standing and lacking semi-natural habitats that are favoured by foraging/commuting bats. The majority of the built structures are of negligible or low suitability for roosting bats, being of modern construction, lacking obvious potential roost features, with poor connectivity to surrounding semi-natural habitats and prone to disturbance from noise and artificial lighting, as well as being used by gulls. This is reflected in low levels of bat activity inside the Works Area. The semi-natural habitats within and the wider Site, bordering the Works Area in places, are more suitable for foraging and commuting bats, incorporating semi-improved grassland, tall ruderal vegetation, standing water (ponds/ditches), woodland and scrub, as well as mosaics of these habitat types. Wooded areas include suitable bat roost habitat, including trees and approximately 60 bat boxes. Bat activity attributable to at least 11 species was recorded within the Site: Natterer's (*Myotis nattereri*), Daubenton's (*Myotis daubentonii*), common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*); brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctule*); Leisler's bat (*Nyctalus leisleri*); barbastelle (*Barbastella barbastellus*); greater horseshoe (*Rhinolophus ferrumequinum*); and lesser horseshoe (*Rhinolophus hipposideros*). Species previously recorded roosting around the perimeter of the double security fence in bat boxes include common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, Natterer's bat, noctule and Leisler's bat. A tree within approximately 50 m of the double security fence was confirmed as a roost (species unconfirmed) potentially used by individual bats or small groups of males occasionally, which is typical of common and soprano pipistrelle. Seven pregnant soprano pipistrelles captured within a 2.5-hour period in May 2019 in woodland, close to the HPB double security fence, signify a maternity roost is likely to nearby (within 3 km).
Birds (breeding)	Desk Study (**Appendix 8A**) Breeding bird surveys (**Appendix 8F**)	2019 (Baseline verification in 2022)	The breeding bird surveys recorded low numbers of common and widespread species that are typical of Somerset. Eight species recorded breeding (or potentially breeding) are of notable importance for biodiversity conservation: Lesser black-backed gull (*Larus fuscus*) is proposed for future consideration as a qualifying feature of

Ecological feature/ survey	Survey/ data sources	Last surveyed	Baseline summary
	Baseline verification (**Appendix 8J**) Breeding gull surveys at HPB[68].		the Severn Estuary Special Protection Area and/or Ramsar site[69]; Cetti's warbler (*Cettia cetti*) and peregrine (*Falco peregrinus*) are listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) [70]; and Five Species included on the Birds of Conservation Concern (BoCC) Red List[71]; and/or Species of Principal Importance for Biodiversity Conservation (SPI), including dunnock (*Prunella modularis*), herring gull (*Larus argentatus*), linnet (*Linaria cannabina*), skylark (*Alauda arvensis*) and song thrush (*Turdus philomelos*); and Annual monitoring to inform the HPB Land Management Annual Reviews (LMARs) also recorded marsh tit (*Poecile palustris*), a BoCC red list species and Species of Principal Importance for Biodiversity Conservation. Annual monitoring of nesting gulls at HPB (2020 to 2023) has recorded a stable nesting population of herring gull: 186 (2020), 191 (2021), 189 (2022) and 185 (2023). A total of 20 pairs of lesser black-backed gull were recorded in 2019, with 7 pairs recorded in 2021; and 6 pairs in 2022 and 2023.
Birds (non-breeding)	Desk Study (**Appendix 8A**) Bird surveys (**Appendix 8F**) Baseline verification (**Appendix 8J**)	2019/20 (Baseline verification in 2022)	The non-breeding bird assemblage comprises relatively low numbers of common and widespread species that are typical of the county (Somerset) and coastal habitats (beach, shale, rock bed and open estuary) adjacent to the Site and including: ▪ Three species listed as qualifying features of the Severn Estuary SPA and/or Severn Estuary Ramsar, including dunlin (*Calidris alpina*), redshank (*Tringa totanus*) and shelduck (*Tadorna tadorna*);

[68] WSP (2020/2021/2022/2023) Hinkley Point B Nuclear Power Station Nesting Gull Population Surveys 2020/2021/2022/2023

[69] JNCC (2022) Special Protection Areas - List of Sites (online). Available at: https://jncc.gov.uk/our-work/list-of-spas/ (Accessed August 2024).

[70] UK Government (1981) Wildlife and Countryside Act 1981 (as amended) (online). Available at: http://www.legislation.gov.uk/ukpga/1981/69 (Accessed August 2024).

[71] JNCC (2021) Birds of Conservation Concern 5 (online). Available at: https://jncc.gov.uk/news/bocc5/#:~:text=Amongst%20the%20new%20additions%20to,the%20UK%20in%20recent%20decades (Accessed August 2024).

Ecological feature/ survey	Survey/ data sources	Last surveyed	Baseline summary
			▪ Two species listed as qualifying features of the Somerset Levels and Moors SPA and Ramsar - lapwing (*Vanellus vanellus*) and teal (*Anas crecca*); ▪ Ten species listed on Bridgwater Bay SSSI citation, including curlew (Numenius arquata), dunlin, knot (Calidris canutus), mallard (Anas platyrhynchos), redshank, ringed plover (Charadrius hiaticula), shelduck, teal, turnstone (Arenaria interpres) and wigeon (Mareca penelope); ▪ Three species of Principal Importance for biodiversity conservation, including brent goose (Branta bernicla), herring gull and lapwing; and ▪ Three species listed on the Birds of Conservation Concern (BoCC) red-list, including curlew, herring gull and lapwing. Species recorded on more than 60% of survey visits include: curlew, mallard, shelduck, turnstone, wigeon; brent goose, oystercatcher (*Haematopus ostralegus*) and pintail (*Anas acuta*).
Great crested newt	(**Appendix 8A**) Great crested newt survey (**Appendix 8G**) Baseline verification (**Appendix 8J**)	2019 (Baseline verification in 2022)	Three ponds were identified within the Study Area (the Site plus a 500 m perimeter area). Two of these were categorised as being 'Good' habitat for great crested newt and the other was categorised as 'Below Average' habitat for this species. All three ponds tested negative for great crested newt eDNA, and this species is unlikely to occur within the Study Area.
Reptiles	(**Appendix 8A**) Reptile survey (**Appendix 8H**) Baseline verification (**Appendix 8J**)	2019 (Baseline verification in 2022)	The survey recorded a low population of slow worm (*Anguis fragilis*) and grass snake (*Natrix helvetica*) within the Survey Area (the Site and a 100 m perimeter area). The survey recorded a concentration of slow worms to the south-west of the Works Area, inside the Site, associated with areas of tall ruderal vegetation and scattered scrub. A grass snake was recorded approximately 95 m south-east of the Site, adjacent to the Works Area (sewage works).
Invertebrates	(**Appendix 8A**) Invertebrate survey (**Appendix 8I**)	2019 (Baseline verification in 2022)	The mosaic of habitats within the Site and perimeter areas, mainly within Hinkley LWS, include grassland, coastal habitats, ponds, scrub and woodland and support a diverse invertebrate assemblage. The survey recorded 304 terrestrial invertebrate species and 47 aquatic invertebrate taxa.

Ecological feature/ survey	Survey/ data sources	Last surveyed	Baseline summary
	Baseline verification (**Appendix 8J**)		Annual butterfly monitoring to inform the LMARs recorded a diverse assemblage of up to 25 butterfly species, including records of Species of Principal Importance for the Conservation of Biodiversity e.g., wall (*Lasiommata megera*) and small heath (*Coenonympha pamphilus*).
Invasive Non-native Species	Desk Study (**Appendix 8A**) Habitat survey (**Appendix 8B**) Baseline Verification (**Appendix 8J**)	2022	Canadian waterweed (*Elodea canadensis*), Japanese knotweed (*Reynoutria japonica*) and Himalayan balsam (*Impatiens glandulifera*) have been recorded within the land surrounding the Site, with the latter recorded near a ditch at the eastern edge of the Site.

Future baseline

8.5.10. Climate change is likely to alter the status and distribution of many species and the composition of habitats and communities in the long term. Climate change scenarios cannot be predicted with certainty, although the Met Office has produced climate change projections for the 21st Century[72].

8.5.11. There is potential for sea level rise to erode the coast around Hinkley Point over the long decommissioning period. Coastal erosion adjacent to HPB is however likely to be restricted by existing coastal defences and would potentially result in only limited loss/inundation of areas of semi-improved grassland and broadleaved plantation. These habitat types are of relatively low biodiversity conservation importance and the loss of a small proportion of these common/widespread habitat types would have a negligible effect on the future baseline status of other ecological features. This would be further reduced via the management and maintenance of coastal defences adjacent to HPB in accordance with current coastal management plans.

8.5.12. The responses of individual species, populations and communities to climate change rely on complex physiological, behavioural and potentially evolutionary responses to the interaction between, and combined effects of, a number of variables such as atmospheric pollutant levels, ambient temperatures, rainfall and humidity. As climate change scenarios cannot be predicted with confidence, and the responses of a wide range of species are uncertain, it is appropriate to base the predicted future baseline status of habitats and species on the current status of these features, as well as any currently apparent or predicted trends in status, taking into account relevant, published and widely accepted data sources.

[72] Met Office (2019). UK Climate Projections: Headline Findings. July 2021. Version 3 (Online) Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/summaries/index (Accessed August 2024).

8.5.13. A gradual improvement, rather than deterioration, in the status of ecological features within the Study Area would be consistent with England's Biodiversity Strategy[73]. In the absence of the Proposed Works, however, large shifts in the baseline status of ecological features over the period of the Proposed Works are not predicted. This is because it is a reasonable assertion that current land use and management practices are likely to continue. It is appropriate therefore to base the assessment on the current status of ecological features within the Study Area.

8.5.14. The future baseline during the Preparations for Quiescence phase is likely to be comparable to the current baseline; the likelihood of changes in the baseline over the much longer Quiescence phase, leading up to the Final Site Clearance phase is less certain. The baseline will therefore be subject to periodic update and review, during both phases, informed by routine biodiversity monitoring to be incorporated into a decommissioning Environmental Management Plan (EMP). The results of this monitoring will further inform site working practices and refinements to embedded environmental measures, such that the effects of the Proposed Works on ecological features continue to be mitigated and are **Not Significant.**

8.6 Embedded environmental and good practice measures

8.6.1. Embedded environmental and good practice measures to reduce the potential effects of the Proposed Works on terrestrial biodiversity and birds are outlined in **Table 8-14**.

[73] Defra (2011). Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services

Table 8-14 - Summary of Embedded Environmental Measures

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
Measures to protect habitats and biodiversity conservation sites: In advance of site works (including preparatory investigations/enabling works), information on the sensitive ecological features that are on/near the Site will be shared with the relevant working party to ensure appropriate precautionary working practices are developed and implemented. Inspection and routine monitoring will be carried out by an Ecologist (Clerk of Works), also referred to as 'ECoW', for planned and ongoing works as appropriate. Habitats (coast, woodland, grassland) within and immediately adjacent to the Works Area will continue to be managed in accordance with the IMS. Whilst tree loss to facilitate works is unlikely, any unavoidable tree loss to the Proposed Works will be limited and compensated through planting of a replacement tree for each one that is removed within Hinkley LWS or bordering areas. Pollution risk and pollution controls will be managed in accordance with the IMS, which aligns to best practice guidance Dust emissions will be mitigated using standard good practice controls to be set out in a Dust Management Plan and implemented as part of the EMP during the Preparations for Quiescence and Final Site Clearance phases. Embedded measures that will limit dust emissions are detailed further in **Chapter 6: Air Quality**.	EMP incorporated into the HPB Integrated Management System, including all embedded environmental measures, for example: ▪ Pollution Prevention Plan ▪ Pollution Incident Response Plan ▪ Dust Management Plan	Embedded measure
Measures to protect mammals and other fauna: Baseline verification surveys will be undertaken, in accordance with best practice guidance, to provide further monitoring of legally protected species, and inform the EMP. If verification surveys identify the potential to impact on species not identified previously, additional measures or surveys may apply. Where practicable, within constraints associated with the Proposed Works, excavations are to be backfilled or covered and securely sealed or will have a means of escape for any entrapped fauna, for example gradually sloping sides, or ramps extending from the base of the excavation up to the ground surface. Where this is impracticable during the works, voids will be monitored,	EMP	Embedded measure

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
and any entrapment of fauna will be reported to the ECoW who will recommend additional working practices as appropriate. Gates to compound areas are to be designed to prevent mammals from gaining access and would be closed at night. Any temporarily exposed pipes would be capped when contractors are off site to prevent mammals from gaining access. Construction/demolition materials are to be stored in predetermined parts of the Works Area, over 30 m from adjacent habitats and wherever practicable elevated off the ground (e.g. on pallets), or stored within skips prior to their removal, unless otherwise agreed by the ECoW. Storage and handling of materials should minimise the risk of creating refuge for, or harming, mammals and other fauna. As far as practicable, any areas/mounds of spoil and/or earth are to be fully compacted, removing cracks/crevices that could create wildlife refuges; No litter or waste materials are to be discarded in Works Areas as they could create temporary refuges for wildlife. Remain vigilant and aware of the risk of encountering mammals, for example otter, badger and hedgehog (Erinaceus europaeus), when driving to and from the Site. A low maximum speed limit will be implemented within the Works Area, in accordance HPB's established safety procedures relating to vehicle movements. Statutory speed limits will be adhered to on approach to the Works Area via surrounding routes. This will limit the risk of animal mortality due to traffic collisions. In the event personnel/contractors observe a protected species (e.g. otter, badger, bat, nesting bird etc), or suspect such species to be present within or adjacent to works areas, all work shall cease and the advice of the ECoW will be sought immediately. In advance of site works (including preparatory investigations/enabling works), the ECoW will brief the Principal Contractor on the sensitive ecological features that are on/near the Site and the Principal Contractor will ensure all site staff/personnel are aware of the precautionary working practices set out in the EMP..		

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
Additional measures to protect otter In advance of demolition activities, surveys of the work areas and in the vicinity will be carried out by qualified specialist as appropriate and in accordance with the IMS. In the event otter is recorded, appropriate method of work and mitigation will be developed and implemented in accordance with the advice from the qualified specialist. In the event otter is recorded the EMP will be updated to include further embedded measures to protect this species.	EMP	Embedded
Additional measures to protect bats: No bat roosts were recorded within the Works Area, however prior to demolition or modification of built structures (typically in the spring/summer period prior to demolition), preliminary roost assessment and any follow-up surveys that are necessary will be carried out by qualified specialist in accordance with best practice guidance (as set out in the IMS). In the event a bat roost is discovered it will be removed under an EPS licence to ensure compliance with the legal protection of bats and an appropriate method of work and mitigation implemented. Wherever practicable within the constraints of site security and safety requirements, the lighting scheme employed throughout the Proposed Works will minimise light trespass onto adjacent habitat and is to be designed based on good practice principles (Bat Conservation Trust & Institute of Lighting professionals 2023[74]).	EMP Lighting scheme	Embedded measure

[74] Bat Conservation Trust (BCT) & Institute of Lighting Professionals (2023). Guidance Note GN08/23: Bats and Artificial Lighting at Night. Institute of Lighting Professionals, Rugby, Warwickshire.

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
Additional measures to protect badger: In advance of demolition activities, surveys of the work areas and in the vicinity will be carried out by qualified specialist in accordance with best practice guidance (managed through the implementation of the IMS). In the event badger is recorded, appropriate method of work and mitigation will be developed and implemented in accordance with best practice guidance.	EMP	Embedded measure
Measures to protect hedgehog: There are no records of hedgehog within 3 km of the Works Area within the past 10 years and this species is therefore scoped-out of the assessment. Hedgehog is however a SPI that is relatively common and widespread and therefore site staff and contractors will remain alert to the possible presence of hedgehog, also recognising that it is estimated that Britain's hedgehog population has declined by 73%[75]. Any hedgehog encountered during the Proposed Works will be removed from the Works Area and released into suitable habitat that will remain undisturbed.	EMP	Embedded measure
Additional measures to protect reptiles: In the event habitat disturbance at the edges of the Works Area is unavoidable, the area of disturbance will be kept to the practicable minimum and additional precautions are to be implemented in accordance with the advice from the qualified specialist and best practice	EMP	Embedded measure

[75] The Mammal Society (2019). Saving Britain's Wildlife. Are we driving hedgehogs to extinction? Available online: https://www.mammal.org.uk/2019/06/are-we-driving-hedgehogs-to-extinction/ (accessed July 2024

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
Measures to prevent spread of non-native species: In advance of demolition activities, surveys of the work areas and in the vicinity will be carried out by qualified specialist as appropriate and in accordance with the IMS. In the event invasive non-native species (INNS) is recorded, appropriate method of work and mitigation will be developed and implemented in accordance with the advice from the qualified specialist and best practice.	EMP	Embedded measure
Measures to protect birds: Marine works will be avoided between July and September to minimise impacts on moulting Shelduck. In circumstances where work on buildings or disturbance of vegetation during the breeding season is unavoidable, a breeding bird and nest check will be carried out in advance by a qualified specialist as appropriate and in accordance with best practice guidance (managed through the implementation of the IMS). In the case of any active nests are discovered, an exclusion (no disturbance) zone will be confirmed by the qualified specialist until the young birds fledge. In the event disturbance, damage or destruction of a bird's nest is unavoidable this will take place under a Natural England licence to ensure compliance with the legal protection of breeding birds. If a birds' nest is encountered, all works that could directly affect the nest to cease as soon as it is safe to do so. Disturbance of the nest is to be avoided until a qualified specialist has inspected the area and define appropriate measures as required.	EMP	Embedded measure
Review of baseline and updates to embedded environmental measures: The biodiversity baseline will be subject to periodic update and review, informed by routine biodiversity monitoring to be incorporated into the decommissioning EMP. The results of this monitoring will further inform site working practices and refinements to embedded environmental measures, such that the effects of the Proposed Works on ecological features continue to be not significant.	EMP (monitoring plan)	Embedded measure

8.6.2. The habitat losses to the Proposed Works are likely to be negligible. The biodiversity units within the Works Area have been calculated using the biodiversity metric[76], approved by Defra for calculating Biodiversity Net Gain (BNG). The metric is used to determine the anticipated loss of biodiversity units to the Proposed Works and preliminary calculations of the BNG baseline are appended (**Appendix 8L**).

8.6.3. At this time, BNG is not required under EIADR. However, the requirement for BNG will be kept under review by the Applicant (and future Site Licensee).

8.7 Assessment methodology

8.7.1. The project-wide assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. Whilst this has informed the approach that is adopted in the terrestrial biodiversity and ornithology chapter, it is necessary to align this methodology with good practice in Ecological Impact Assessment[22,1].

8.7.2. The assessment is based on the results of the desk study and field surveys, as well as relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.

8.7.3. For each scoped-in ecological feature (**Section 8.9**), the potential effects of the Proposed Works on it are assessed against its current baseline condition.

8.7.4. Where part of a designated site is located within the ecological ZoI relating to a particular biophysical change that is likely to occur as a result of the Proposed Works, the effects on the designated site as a whole are assessed. A similar approach is taken for areas of habitat.

8.7.5. For species that occur within the ZoI, the assessment considers the total area that is used by the affected individuals or the local population of the species (e.g. for foraging or as breeding territories), rather than the specific defined footprint of the Proposed Works.

8.7.6. The assessment process informs the environmental measures that are embedded into the Proposed Works (Table 8-14) to avoid or reduce adverse effects or to deliver enhancements.

8.7.7. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[77] (hereafter referred to as “EIADR”) recognises that decommissioning will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identify those environmental resources that warrant investigation as those that are “*likely to be significantly affected by the project*”[78,79].

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[76] The Defra Biodiversity Metric 4, was applied and has since been replaced by the Statutory Metric. It is valid to continue to use the same version of the metric for the lifetime of the project.

[77] Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

[78] The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018, Regulation 5. (Online) Available at: https://www.legislation.gov.uk/uksi/2018/834/regulation/7/made (Accessed November 2023).

[79] The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018, Schedule 1. (Online) Available at: https://www.legislation.gov.uk/uksi/2018/834/schedule/1/made (Accessed November 2023).

8.7.8. The EIADR do not define significance. The significance of an effect resulting from a development is determined in this assessment by reference to the sensitivity (or 'importance') of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Proposed Works.

8.7.9. CIEEM[22] defines a significant effect as one "*that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general*".

8.7.10. When considering likely significant effects on ecological features, whether these be adverse or beneficial, the following characteristics of environmental change are taken into account[80]:

- extent – the spatial or geographical area over which the environmental change may occur;
- magnitude – the size, amount, intensity or volume of the environmental change;
- duration – the length of time over which the environmental change may occur;
- frequency – the number of times the environmental change may occur;
- timing – the periods of the day/year etc. during which an environmental change may occur; and
- reversibility – whether the environmental change can be reversed through restoration actions.

Determining importance of ecological features

8.7.11. It is necessary to identify which ecological features identified through the desk study and field surveys (**Appendix 8A** to **8K**) are 'important'[81] in the context of the Proposed Works. Following CIEEM guidance, the importance of ecological features is first determined with reference to UK legislation (**Table 8-1**) and policy (**Table 8-2**) and then with regard to the extent of habitat or size of population that may be affected by the Proposed Works.

8.7.12. As the importance of ecological features is determined with regard to the extent of habitat or size of population that may be affected by the Proposed Works, the level of importance can differ from that which would be conferred by legislative protection or identification as a conservation priority and from one development to another. For example, water vole is important at a national level because it is a species of principal importance for biodiversity conservation and has exhibited a population decline of more than 25% in the last 25 years. However, a small population that could be affected by a development would be assessed as being of less than national importance if there is alternative well-connected and suitable habitat nearby that has the capacity to support individuals that may be displaced.

8.7.13. Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features has been used to inform the categorisation described in **Table 8-15** to determine importance for the purposes of this assessment. Where detailed criteria or contextual data are not available, professional judgement was used to determine the level of importance.

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[80] The definitions of the characteristics of environmental change are based on the descriptions provided in CIEEM 2018. Other chapters in this EIA Report may use some of the same terms albeit with a different definition.

[81] Importance relates to the quality and extent of designated sites and habitats, habitat/species rarity and its rate of decline. Ecological features that are not considered to be important are those that are sufficiently widespread, unthreatened and resilient and with populations that will remain viable and sustainable irrespective of the Proposed Works.

8.7.14. All ecological features that are of sufficient importance that effects on them could be significant are included in the scope of the assessment. Where protected species are present and there is the potential for a breach of the associated legislation, those species are also treated as 'important' ecological features.

Table 8-15 - Importance of ecological features

Geographic context of importance	Example/ description
International or European	▪ International sites including Ramsar sites and European sites (SPAs, SACs, plus candidate/potential sites); and ▪ Areas of habitat or populations of species that meet the published selection criteria for designation as an international site, based on discussions with Natural England and field data collected to inform the assessment, but are not currently designated as such.
National	▪ Nationally designated sites including SSSIs and National Nature Reserves (NNRs); ▪ Areas (and the populations of species which inhabit them) which meet the published criteria and guidelines for selection of biological SSSIs, but which are not themselves designated, based on field data collected, and in agreement with Natural England; ▪ habitats and species of principal importance, Red listed and legally protected species that are not addressed directly in Part 2 of the "Guidelines for Selection of Biological SSSIs" but can be determined to be of national importance using the principles described in Part 1 of the guidance; and ▪ Areas of Ancient Woodland.
Regional	Species of principal importance that are considered to be of regional importance in the context of published information on population size and distribution.
County	▪ LNRs and Non-statutory designated sites; and ▪ Areas which, based on field data collected to inform the Ecological Impact Assessment (EcIA) and EIA/EIADR, meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans) but which are not themselves designated.
Local	▪ Habitats and species of principal importance, Red listed species and legally protected species that based on their extent, population size, quality etc are determined to be at a lesser level of importance than the geographic contexts above; ▪ Common and widespread semi-natural habitats occurring in proportions greater than may be expected in the local context; and

Geographic context of importance	Example/ description
	▪ Common and widespread native species occurring in numbers greater than may be expected in the local context.
Negligible	▪ Common and widespread semi-natural habitats and species that do not occur in levels elevated above those of the surrounding area; and ▪ Areas of heavily modified or managed land uses (e.g. hard standing used for car parking and roads).

Magnitude of Change

8.7.15. A scale of magnitude of environmental change resulting from the Proposed Works is described in **Table 8-16** to provide an understanding of the relative change from the baseline position, be that an adverse or beneficial change.

Table 8-16 - Establishing the magnitude of change

Scale of change	Criteria and resultant effect
High	The change permanently (or over the long-term) affects the conservation status of a habitat / species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area and relative to the wider habitat resource / species population, a large area of habitat or large proportion of the wider species population is affected. For designated sites, integrity is compromised. There may be a change in the level of importance of the receptor in the context of the project ZoI.
Medium	The change permanently (or over the long-term) affects the conservation status of a habitat / species reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area and relative to the wider habitat resource / species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a change in the level of importance of this receptor in the context of the project ZoI.
Low	The quality or extent of designated sites or habitats or the sizes of species' populations, experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability and they are not expected to result in any permanent change in the conservation status of the species / habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in terms of its importance in the context of the project ZoI.
Very Low	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats / species receptors or the integrity of designated sites.
Neutral	A change, the level of which is so low, that it is not discernible on designated sites or habitats or the size of species' populations.

Determining significance – adverse and beneficial effects

8.7.16. Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost as a result of the Proposed Works. Beneficial effects are assessed as those where a resulting change from baseline improves the quality of the environment (e.g. increases species diversity, increases the extent of a particular habitat etc., or halts or slows down an existing decline). For a beneficial effect to be considered significant, the conservation status would need to positively increase in line with a magnitude of change of "high" as described in **Table 8-16**.

8.7.17. Conservation status is defined as follows:

"*For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and typical species within a given geographical area*;

For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area"[22]

8.7.18. The decision as to whether the conservation status of an ecological feature would alter is made using professional judgement, drawing upon the information produced through the desk study, field survey and assessment of how each feature is likely to be affected by the Proposed Works.

8.7.19. A similar procedure is used where designated sites may be affected by the Proposed Works, except that the focus is on the effects on the 'integrity' of each site; defined as:

"*The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified*".

8.7.20. The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the Site has been designated. Where these features are not clearly defined, which is often the case for non-statutory biodiversity sites, it is necessary to use professional judgement to identify the interest features or obtain additional information about the interest features from Natural England, Somerset Wildlife Trust or the local planning authority responsible for identifying these sites, so that sufficient information on which to base an assessment is available.

8.8 Assumptions and limitations

8.8.1. Limitations relating to the baseline data underlying the assessment are identified in **Section 8.3**. There are no further assumptions or limitations associated with this chapter.

8.8.2. A precautionary approach to the assessment has been adopted in accordance with good practice (CIEEM[22]), avoiding underestimates of likely significant effects.

8.9 Scope of the assessment

8.9.1. During the Preparations for Quiescence, the Proposed Works related to the terrestrial environment involve deplanting and demolition to ground level of the majority of built structures, with the exception of the Reactor Building, which will be modified to create the Safestore. This will be followed by routine maintenance during the Quiescence phase and demolition of the Safestore and ground remediation during Final Site Clearance.

Study Area

8.9.2. The Study Area, including the different components relating to each type of ecological feature, is summarised in **Section 8.3**. The Study Area was determined based on good practice guidance, the types of ecological features known to be present, and the potential effects that could occur.

8.9.3. The Study Area was defined on a precautionary basis to ensure that, as a minimum, the ZoI relevant to all relevant ecological features are covered during baseline data collection. The Study Area has been kept under review throughout the EIA process, including responding to the iterative design process for the Proposed Works to ensure that the baseline characterisation remains adequate to enable the assessment of all likely significant effects on ecological features.

Potential receptors

8.9.4. The Scoping study identified ('scoped-in') the terrestrial biodiversity and ornithology receptors that are likely to be subject to significant effects as summarised in **Table 8-17**.

8.9.5. Ecological features that are unlikely to be subject to significant effects, for example where they are remote from the Works Area or there is no pathway via which an effect on them could occur, are not considered further.

8.9.6. No evidence of otter or water vole activity (**Appendix 8C**) was recorded by the Baseline Surveys or by the more recent Baseline Verification (**Appendix 8J**) and there are no records of hedgehog within 3 km of the Site. Similarly, the Baseline Surveys recorded absence of great crested newt (**Appendix 8G**). The Proposed Works are therefore predicted to have no effect on otter, water vole, hedgehog or great crested newt and these species are scoped-out of the assessment, also recognising that the onshore elements of the Proposed Works are largely confined to hardstanding within the Works Area, with no loss of aquatic habitat and neglibible loss of terrestrial habitat.

8.9.7. The status of otter, great crested newt and hedgehog will however be kept under review, through routine biodiversity monitoring to be incorporated into the decommissioning EMP. This is because, whilst the baseline surveys identified no otter activity, otter has previously been recorded within 3 km and hedgehog is a relatively common widespread species. Therefore the working practices outlined in **Table 8-14** will be implemented on a precautionary basis to limit the risk of adverse effects on these two species and any associated risk of failure to comply with the relevant biodiversity conservation legislation.

8.9.8. The effects of the Proposed Works on invertebrate assemblages are assessed as part of the assessment of effects on Hinkley LWS, which supports the main invertebrate interest at the Site.

8.9.9. Decommissioning of marine infrastructure during the Preparations for Quiescence phase could have effects on diving birds. Only small numbers of relatively common diving birds, including cormorant, were recorded in the vicinity of HPB marine infrastructure. The effects of the Proposed Works on diving birds are therefore scoped-out of the assessment.

8.9.10. There are SPAs within 200 km of the Site that have marine seabird qualifying features (e.g. gannet, puffin, storm petrel, Manx shearwater). These SPAs include Skokholm and Skomer (breeding Manx shearwater) and Grassholm (breeding gannet) and both are over 100 km from the Works Area. The foraging range of qualifying features of both sites overlap the Study Area, however these species primarily forage in the wider offshore environment, beyond the marine elements of HPB infrastructure. There is likely therefore to be no functional link between the ZoI and these SPAs and

the SPAs are scoped-out of the assessment. This is explained further in the HRA Screening Report accompanying this ES.

Table 8-17 - Receptors likely to be subject to Significant Effects

Ecological feature (receptor)	Importance (legislation and policy)	Importance (The Site and Works Area)	Justification
Biodiversity sites (statutory – International)	International	-	There are six statutory biodiversity sites (international importance) within 20 km: Severn Estuary SAC; Severn Estuary SPA; Severn Estuary Ramsar; Exmoor and Quantock Oakwoods SAC; Somerset Levels and Moors SPA; and Somerset Levels and Moors Ramsar. One or more of these designations could be affected by habitat loss or degradation due to atmospheric emissions or discharges to water and/or displacement of associated species due to noise, vibration, lighting or visual disturbance.
Biodiversity sites (statutory - UK)	National	-	There are five statutory biodiversity sites (national importance) within 10 km: Berrow Dunes SSSI; Bridgwater Bay SSSI; The Quantocks SSSI; Ge-Mare Farm Fields SSSI; and Somerset Wetlands NNR. One or more designations could be affected by habitat loss or degradation due to atmospheric emissions or discharges to water and/or displacement of associated species due to noise, vibration, lighting or visual disturbance.
Biodiversity sites (non-statutory)	County	County	There are nine Local Wildlife Sites (LWS) within 3 km: Hinkley (adjacent to and in places overlapping the Works Area); Blue Anchor to Lilstock Cliff; Cole Pool Field; Fairfield House Park; Honibere Wood; Martin's Wood; Monk Wood; Mud House Copse; Wick Park Covert. One or more designations could be affected by direct physical habitat loss/damage or degradation due to atmospheric emissions or discharges to water and/or displacement of associated species due to noise, vibration, lighting or visual disturbance.
Terrestrial habitats	National	County	In places the Works Area is bordered by broadleaved plantation, semi-improved neutral grassland, scrub and tall ruderal vegetation within Hinkley LWS. These habitats could be disturbed by the Proposed Works. The Proposed Works

Ecological feature (receptor)	Importance (legislation and policy)	Importance (The Site and Works Area)	Justification
			could spread invasive non-native species leading to the degradation of these habitats. There are habitat types that potentially qualify as habitats of Principal Importance for Biodiversity Conservation situated within approximately 3 km (**Appendix 8A**), which could be affected by atmospheric emissions during the Proposed Works.
Bats	International	Up to international	The following species have been recorded: Natterer's; Daubenton's; common pipistrelle; soprano pipistrelle; Nathusius' pipistrelle; brown long-eared; noctule; Leisler's bat; barbastelle; greater horseshoe; lesser horseshoe; Plecotus sp.; and Myotis sp. All bat species are EPS, and a number are also SPI. No bat roosts were recorded within the Works Area and the Works Area is poor bat habitat. The Site is however close to the outer limit of the Core Sustenance Zone (CSZ) around barbastelle roosts within Exmoor and Quantock Oakwoods SAC. Some UK populations of natterer's bat are also of international importance. Bats could however be subjected to loss/severance of habitat (roosting / foraging / commuting) and disturbance (visual / noise / vibration / lighting).
Badger	National	Local	This legally protected species is common and widespread, and the Works Area is poor badger habitat. Badger could however be subjected to loss/severance of habitat and disturbance (visual / noise / vibration / lighting) effects and/or harm due to the Proposed Works.

Ecological feature (receptor)	Importance (legislation and policy)	Importance (The Site and Works Area)	Justification
Birds (breeding)	National	County	Breeding (or potentially breeding) pairs / territories of eight species that are species of principal importance and/or listed on Schedule 1 of the Wildlife and Countryside Act 1981 and/or BoCC red list were recorded by the baseline surveys. The recorded numbers of breeding pairs of some species (e.g. herring gull) are of up to County-level biodiversity conservation importance. These species could be subject to harm due to the Proposed works and disturbance and displacement (visual / noise / vibration / lighting impacts).
Birds (wintering/ passage)	National	Local	Assemblages of birds that are qualifying features of statutory biodiversity conservation sites are considered separately and are of national and/or international biodiversity conservation importance. Surveys of non-breeding (wintering/passage) birds also recorded species of Principal Importance for Biodiversity Conservation and BoCC Red List species. These species were recorded intermittently, infrequently and/or in small numbers. They could be subject to harm due to site clearance and disturbance/displacement (visual / noise / vibration / lighting).
Reptiles	National	County	Low populations of both slow worm and grass snake were recorded in Hinkley LWS. Both are legally protected and species of principal importance. Both remain relatively widespread in the south-west and are concluded to be of up to County-level importance on a precautionary basis. The Works Area is largely devoid of suitable habitat for reptiles. These species could however be subjected to harm due to the Proposed Works.

Likely significant effects

8.9.11. Likely significant effects on terrestrial biodiversity and ornithology that are taken forward for assessment are summarised in **Table 8-18**.

8.9.12. The effects primarily relate to the Preparations for Quiescence and Final Site Clearance Phases. The assessment of the effects of these phases on ecological features are considered together,

recognising that the nature of the effects of both phases on ecological receptors are similar and relate to demolition and earthworks and associated site activities.

8.9.13. There are likely to be no significant effects on ecological features during the Quiescence phase, recognising that there is currently anticipated to be no earthworks and limited maintenance activity on the Site during that phase, and the embedded environmental measures (**Table 8-14**) will continue to implemented during routine site maintenance, including and not limited to measures to protect bats.

Table 8-18 - Likely significant effects on terrestrial biodiversity and ornithology

Phase and activity	Effect	Receptor (Ecological Feature)
Preparations for Quiescence phase (demolition, earthworks, excavation)	Disturbance/degradation of habitats due to physical habitat loss / damage and displacement of SPA bird species due to disturbance (visual/noise/ vibration/lighting). Loss/severance of habitat (roosting/foraging/ commuting) and disturbance (visual/noise/vibration/lighting) effects on Barbastelle bats .	Severn Estuary SAC, SPA and Ramsar Site, Quantock Oakwoods SAC.
	Disturbance/degradation of habitats, and adverse effects on associated species due to physical habitat loss damage and/or discharges to water. Bird species that are interest features of Bridgwater Bay SSSI/NNR subject to disturbance (visual/noise/vibration/lighting) and displacement.	Bridgwater Bay SSSI/Somerset Wetlands NNR
	Emissions to air (dust and emissions from plant and vehicle movements) causing habitat degradation.	Statutory biodiversity conservation sites; non-statutory biodiversity conservation sites; Habitats of Principal Importance for biodiversity conservation.
	Degradation of habitats and disturbance effects on associated species (e.g. plant and invertebrate species and assemblages).	Hinkley LWS.
	Loss and/or severance of habitats and/or disturbance (noise, vibration, visual and lighting), causing harm to, and / or disturbance / displacement of fauna.	Bats, badger, birds (breeding and non-breeding) and reptiles.

Phase and activity	Effect	Receptor (Ecological Feature)
	Earthworks causing the spread of non-native/invasive plant species, which could displace/out-compete native species and encroach into other/new habitats.	Habitats and native plant species.
Final Site Clearance	Loss and/or severance of habitats and/or disturbance (noise, vibration, visual and lighting), causing harm to, and/or disturbance/displacement of fauna.	Bats, badger, birds (breeding and non-breeding) and reptiles.
	Earthworks causing the spread of non-native / invasive plant species, which could displace / out-compete native species and encroach into other / new habitats, leading to habitat degradation.	Habitats and associated plant species.

8.10 Assessment of effects

Statutory Biodiversity Conservation Sites (international importance)

8.10.1. The assessment of the effects of the Proposed Works on statutory biodiversity conservation sites that are of international importance for the conservation of terrestrial biodiversity is set out below.

8.10.2. The assessment of effects of the Proposed Works on sites that are designated for the conservation of marine taxa and migratory freshwater fish are set out in **Chapter 9: Marine Biodiversity.**

8.10.3. The potential effects of the Proposed Works on European designations are also the subject of a Habitats Regulations Assessment (HRA), which is detailed further in the separate HRA Screening Appraisal.

Preparations for Quiescence phase and Final Site Clearance

Severn Estuary SAC

8.10.4. Severn Estuary SAC is designated for the conservation of marine habitats and anadromous fish species. The assessment of the effects of the Proposed Works on this designation are also assessed in **Chapter 9: Marine biodiversity.**

8.10.5. Severn Estuary SAC is situated immediately adjacent to the Site and part of the Works Area, encompassing the cooling water (CW) outfall infrastructure, which extends into the SAC. Decommissioning of the CW infrastructure during the Preparations for Quiescence phase will take place predominantly at low tide and from within the existing concrete channel. There will therefore be minimal disturbance of intertidal habitat within the SAC. High levels of suspended sediment in the Severn Estuary mean that any localised seabed disturbance is not anticipated to result in an increased sediment load. This limited, temporary and localised disturbance is likely to have a negligible effect on the conservation status of intertidal habitats within the SAC.

8.10.6. Dust emissions during construction, demolition, earthworks and trackout[82] activities could smother habitats adjacent to the Works Area, leading to deterioration in the conservation status of statutory biodiversity conservation sites. The effects of dust are set out in **Chapter 6: Air Quality**. Based on the Institute of Air Quality Management (IAQM) guidance[83] dust emissions are most likely to affect ecological receptors within 0.05 km of the boundary of the Works Area and the route(s) used by mobile machinery, increasing to 0.25 km from the Site entrance for mobile machinery on the public highway.

8.10.7. As set out in **Chapter 6: Air Quality**, it is estimated that the Proposed Works will generate 30 outward Heavy Duty Vehicle (HDV) movements in any one day. The potential dust emission magnitude associated with trackout is therefore small, also recognising that vehicles within the Site and Works Area will continue to use existing roads, with only limited transit across unmade/bare ground.

8.10.8. Dust emissions from the Proposed Works will be mitigated using standard good practice controls to be set out in a Dust Management Plan and implemented as part of the EMP during the Preparation for Quiescence and Final Site Clearance phases. Embedded measures that will limit dust emissions are detailed further in **Chapter 6: Air Quality**. This will include, for example, siting of stockpiles and dust-generating activities away from sensitive receptors; covering stockpiles; use of enclosed chutes/conveyors and covered skips; use of dust screens/barriers; dampening materials/stockpiles using sprays/mists; and removal of materials that generate dust and/or re-vegetating any areas of exposed earth as early as practicable. Dust emissions are therefore likely to have a negligible effect on habitats within Severn Estuary SAC.

8.10.9. Emissions from HDVs and Light Duty Vehicles (LDVs) during construction and demolition activities could lead to degradation of vegetation within biodiversity conservation sites. Increases in the baseline concentration of oxides of Nitrogen (NOx) and Ammonia (NH3) in particular can lead to poorer plant growth, reduced productivity and eutrophication, which can damage sensitive habitats and biodiversity conservation sites.

8.10.10. **Chapter 16: Traffic and Transport** identifies the preferred construction route. The Zone of Influence of HDV/LDV emissions on biodiversity conservation sites is generally accepted as being 0.2 km[84] from a highway route. This distance is applied to the assessment of effects on sites that are of international biodiversity conservation importance (e.g. SAC). The presence of sites of international importance within 0.2 km of the increase in vehicle emissions is therefore a trigger for more detailed assessment.

8.10.11. **Chapter 6: Air Quality** explains that the threshold at which an increase in traffic flow triggers a detailed assessment of the air quality effects on statutory biodiversity conservation sites is 1,000 Average Annual Daily Traffic (AADT) or 200 AADT for HDVs. The predicted change in traffic levels on the construction route, attributable to the Proposed Works, is 100 LDV AADT (30 HDV AADT).

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[82] Movement of dust and dirt from a construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network.

[83] IAQM (2024). IAQM guidance on the assessment of dust from demolition and construction, Version 2.2 (online). Available from: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf ((Accessed August 2024)).

[84] Natural England (2018). Natural England's approach to advising competent authorities on the assessment of road traffic emissions under the habitats regulations. (online). Available at: https://publications.naturalengland.org.uk/publication/4720542048845824 (Accessed August 2024).

This is well below the threshold that typically triggers a detailed assessment of the effects of vehicle emissions on statutory biodiversity conservation sites.

8.10.12. Effects of NOx emissions on vegetation are considered relative to the Critical Level (CL), which is the concentration in the atmosphere above which adverse effects on receptors such as plants/habitats and ecosystems may occur. An increase in background concentration equivalent to >1% of the CL is widely applied as a threshold for long term impacts on nationally designated sites [85].

8.10.13. JNCC[86] report that at distances of 0.025 km from a road:

- A change in traffic flow of 547 AADT is required to cause a change of 1% of the CL for NOx; and
- A change in traffic flow of 731 AADT is required to cause a change of 1% of the CL for Ammonia.

8.10.14. Although a small area of Severn Estuary SAC is within 0.025 km (<0.01 km) of the construction route. The predicted change in HDV of 30 AADT and change in LDV of 100 AADT associated with the Proposed Works is well below the threshold that would trigger an assessment of air quality effects on the SAC. It is also well below the change in traffic flow that would be likely to cause an increase in background concentration of NOx or Ammonia that is equivalent to >1% of CL at a distance of 0.025 km. It is reasonable to conclude therefore that the predicted increase in road traffic emissions is likely to have a negligible effect on the conservation status of habitats within Severn Estuary SAC.

8.10.15. Overall, there will be only limited localised disturbance of habitat within the Severn Estuary SAC and there is likely to be no degradation of habitats within the SAC due to dust emissions from the Proposed Works. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats with Severn Estuary SAC. The Proposed Works are therefore likely to have a **neutral** effect on the integrity of Severn Estuary SAC, which is **Not Significant**.

Exmoor and Quantock Oakwoods SAC

8.10.16. Habitats that are primary reasons for selection, or qualifying features, of Exmoor and Quantock Oakwoods SAC include old sessile oak woods and alluvial forests. The SAC is however over 6.5 km from the Works Area at its closest point and there is no pathway via which the Proposed Works could have an effect on habitats within the SAC.

8.10.17. The Core Sustenance Zones (CSZ)[87] of barbastelle extend to at least a 6 km radius around a roost. The Site is therefore potentially at the outer edge of the CSZ that extends around barbastelle roosts within Exmoor and Quantock Oakwoods SAC. The level of barbastelle activity within the Site is however low and the Proposed Works will not result in loss or disturbance of bat roosts. The Proposed Works will take place almost entirely within hard standing, which is poor bat habitat and there will be negligible loss of habitat that is of low suitability for bats. Embedded environmental measures (see **Table 8-14**), for example dust control measures, will minimise the risk of habitat

[85] Environment Agency (2016). Air emissions risk assessment for your environmental permit. (online). Available at: https://www.gov.uk/guidance/air-emissions-risk-assessment-for-your-environmental-permit (Accessed August 2024).

[86] JNCC (2021). Guidance on Decision-making Thresholds for Air Pollution. (online). Available at: Main Report: Guidance on Decision-making Thresholds for Air Pollution (jncc.gov.uk) (Accessed August 2024).

[87] The area surrounding a communal bat roost within which habitat availability and quality will have a significant influence on the resilience and conservation status of the colony using the roost.

degradation outside of the Works Area. The Works Area is already extensively illuminated and therefore lighting associated with the Proposed Work has only limited potential to displace small numbers of foraging/commuting barbastelle from the perimeter of the Works Area and it is likely that these bats would move into suitable alternative habitats nearby and elsewhere within Hinkley LWS. The Proposed Works are therefore likely to have a negligible effect on the conservation status of barbastelle.

8.10.18. Bechstein's bat is a qualifying feature of Exmoor and Quantock Oakwoods SAC and has previously been recorded within 1.5 km of the Site. Although the baseline surveys recorded Myotis species, there were no confirmed records of Bechstein's bat within the Site. The CSZ of Bechstein bat is estimated to be 1 km and it is unlikely that the Site is within the CSZ of Bechstein bats that roost in the SAC. The Proposed Works are therefore also likely to have a negligible effect on the conservation status of Bechstein bats and no effect on the colonies of this species that roost within the SAC.

8.10.19. Otter is another qualifying feature of the SAC and the distance between the SAC and the Site is within the dispersal range of this species. Otter has previously been recorded within 200 m of the Site. This species was however not recorded by the baseline surveys and the Works Area lacks suitable otter habitats. The Proposed Works are therefore likely to have a negligible effect on the conservation status of this species.

8.10.20. The Proposed Works are predicted to have a negligible effect on the conservation status of otter and a negligible effect on barbastelle bats and Bechstein's bats that roost within Exmoor and Quantock Oakwoods SAC. The Proposed Works are therefore likely to have a **neutral** effect on the integrity of SPA and Ramsar site, which is **Not Significant**.

Severn Estuary SPA & Severn Estuary Ramsar

8.10.21. Severn estuary SPA and Ramsar site is situated immediately adjacent to the Site. Marine infrastructure within the Works Area extends over intertidal habitats within the SPA and Ramsar site. These are the same habitat areas that are within Severn Estuary SAC as set out above.

8.10.22. Marine habitats and fish are also criteria for the designation of the Ramsar site. The effects of the Proposed Works on this designation are therefore also assessed in **Chapter 9: Marine Biodiversity.**

8.10.23. As set out above in relation to Severn Estuary SAC, decommissioning of CW infrastructure will take place predominantly at low tide and from within the existing concrete CW outfall channel. There will therefore be minimal disturbance of intertidal habitat within the SPA/Ramsar site. This limited, temporary and localised disturbance is likely to have a negligible effect on the conservation status of habitats within the SPA/Ramsar site. There is also likely to be no degradation of Ramsar/SPA habitats due to dust emissions from the Proposed Works and the predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats with Severn Estuary SPA/Ramsar.

8.10.24. The assessment of the predicted effects of the Proposed Works on bird species that are qualifying features of Severn Estuary SPA, and/or criteria for the designation of the Severn Estuary Ramsar site, and any associated effects on the integrity of the SPA and Ramsar site, are summarised below. The qualifying features/criteria relate mainly to wintering and non-breeding birds.

8.10.25. Bewick's swan, gadwall and white-fronted goose were not recorded by the baseline surveys. Redshank and dunlin were recorded infrequently and in low numbers, with redshank and dunlin also recorded in low numbers and/or infrequently by annual surveys at HPC[88] [89] and also surveys carried out annually at HPB to inform LMARs[56]. There is therefore likely to be negligible, low or infrequent use of the ZoI by these species and the Proposed Works are likely to result in no sustained loss of resource (feeding, roosting etc) for these species.

8.10.26. The baseline surveys recorded shelduck in every survey month, with numbers fluctuating during different tidal phases and peak counts usually between two to three hours either side of high tide. Autumnal (passage) peaks were also observed. The peak count of 437 was recorded two-hours before high tide in September, during the birds' autumn passage. The second highest monthly count was 290 in November, with much lower peak counts of 4 to 47 birds in other survey months. The peak count of 437 reaches approximately 8% of the comparable five-year peak average[90] (2015/16 - 2019/20) for the Severn Estuary and 13% of the SPA wintering population.

8.10.27. Annual monitoring in relation to HPC indicates a broadly consistent spread of shelduck across five survey years (2017 – 2023[91, 92, 93, 94]) with birds concentrated around Fenning Island, Stert Island and Stert Point, near the mouth of the River Parrett. These *core roost areas* are sensitive areas for moulting shelduck, with most roosting birds being flightless. There are however likely to be no effects on these core roost areas, which are over 5 km from the Works Area.

8.10.28. Annual monitoring in relation to HPC also identified a smaller secondary concentration of shelduck off Hinkley Point (between 2016 – 2019 in addition to population data recorded between 2016 and 2023), where counts have exceeded 1% of the SPA population in grid squares that are within 500 m of the Works Area. This is consistent with the results of the baseline surveys. Peak counts of shelduck were attributed to birds aggregating on the water over two hours either side of the high tide period. These *rafting* birds were not recorded foraging and did not tend to remain in the same areas for long periods.

8.10.29. Monitoring surveys in July and August 2011 (core moult period), documented within a HPC Report to Inform Habitats Regulations Assessment[95] (RIHRA) reported that the majority of shelduck activity was generally 500 m - 800 m from the mean low water mark (MLW) and the majority of flocks numbered less than 100 individuals, with shelduck able to swim against the tide for distances up to 500 m, which suggests that moulting (flightless) shelduck retain the ability to position themselves within the tidal waters of the estuary.

8.10.30. The Proposed Works on the outfall are to be undertaken outside the sensitive moulting period (July – September), avoiding the period when aggregations of 'flightless' rafting birds have been recorded. It is also of relevance that birds on open water are less likely to be disturbed by activities on land

[88] NNB GenCo (HPC) Ltd. Hinkley Point C Annual Ecological Monitoring Reports: Main Site (2017 - 2021)
[89] NNB GenCo (HPC) Ltd. Hinkley Point C Annual Ecological Monitoring Reports: Main Site (2017 - 2024)
[90] Peak average is the average of the annual peak count over a five-year period.
[91] NNB GenCo (HPC) Ltd. (September 2021). Shelduck Distribution, Population and Disturbance Survey Report – 2017/2018/2019
[92] NNB GenCo (HPC) Ltd. (January 2022). Hinkley Point C Nuclear New Build Shelduck Phase 1 Monitoring – 2020
[93] NNB GenCo (HPC) Ltd. (May 2022). Hinkley Point C Nuclear New Build Shelduck Phase 1 Monitoring – 2021
[94] NNB GenCo (HPC) Ltd. (December 2023). Hinkley Point C Nuclear New Build Shelduck Phase 2 Monitoring – 2023
[95] NNB GenCo (HPC) Ltd. (May 2019). Report to Inform Habitats Regulations Assessment for Proposals to Install terrestrial Mitigation Measures at Steart Point.

than they would be from water-based activities, particularly in this instance where large expanses of open water are available.

8.10.31. The Proposed Works would be undertaken at low tide and any shelduck aggregating at 500 m – 800 m from MLW are likely to be subject to a very low-level or negligible disturbance associated with movement and operation of construction machinery and workforce across the intertidal zone. There is an extensive area of open water utilised by the roosting shelduck at high tide and in the event shelduck occur within 500m of onshore works, and are temporarily disturbed by these activities, they would be able to move short distances to avoid disturbance with little energetic expenditure. This would be likely to have no detrimental effect on their longer-term survival.

8.10.32. Whilst work on the intake structure would be undertaken in open water via pontoon, the structure is >500 m to the west of grid squares where previous monitoring has reported aggregations of shelduck and the work is expected to utilise minimal vessel movements to facilitate the works. The risk of intake works disturbing aggregations of shelduck is therefore minimal. Works within the marine environment will also be scheduled outside of the period July to September inclusive, avoiding the core shelduck moulting period.

8.10.33. Given the temporary nature of the Proposed Works, the avoidance of potentially disturbing works around sensitive high tide and moulting periods and the ability of shelduck to disperse to alternative roosting locations on open water, any low-level disturbance effects are likely to result in no sustained loss of shelduck foraging/roosting resource or contribute to significant energy expenditure by this species.

8.10.34. Species identified for possible future consideration under Ramsar criterion 6 include ringed plover, teal, pintail and lesser black-backed gull (breeding). The baseline surveys recorded ringed plover infrequently (October only) and in low numbers (monthly peak of 14 birds). Teal were also recorded in low numbers, ranging from 3 to 11 birds. Similarly low numbers of both species were recorded by annual monitoring at Hinkley Point C[96]. There is therefore likely to be limited and/or infrequent use of the ZoI by these species and the Proposed Works are likely to result in no sustained loss of resource (feeding, roosting etc) for ringed plover and/or teal.

8.10.35. The baseline surveys recorded a peak count of pintail (Ramsar) of 270 birds in November 2019, equivalent to 34% of the comparable five-year peak average for the Severn Estuary. The recorded counts in other survey months were much lower, ranging from 9 to 61. Similarly, intertidal surveys conducted annual at Hinkley Point C[97] (HPC) recorded a peak count of 210 (2017/18), which was a single observation rather than regular or over sustained periods and with substantially lower peak counts in other years: 2018/19 (72); 2019/2020 (16), 2020/2021 (60); 2021/2022 (96); 2022/2023 (54) and 2023/2024 (46). Numbers of pintail utilising the Study Areas around HPB and HPC therefore fluctuate substantively during different tidal phases, and across survey periods. Given the temporary nature of the Proposed Works along the coast, any reduction in the low-level utilisation of the ZoI by pintail is likely to result in no sustained loss of resource for this species.

8.10.36. The baseline surveys recorded lesser black-backed gull (Ramsar - breeding) breeding on HPB buildings. Breeding gulls are also subject to separate monitoring at HPB[98]. A total of 20 pairs of

[96] NNB GenCo (HPC) Ltd. Hinkley Point C Annual Ecological Monitoring Reports: Main Site (2017 - 2024)
[97] NNB GenCo (HPC) Ltd. Hinkley Point C Annual Ecological Monitoring Reports: Main Site (2017 - 2021)
[98] WSP (2020/2021/2022/2023) Hinkley Point B Nuclear Power Station Nesting Gull Population Surveys 2020/2021/2022/2023

lesser black-backed gull were recorded in 2019, equivalent to 0.98% of the SPA population, 7 pairs (0.34%) in 2021; and 6 pairs (0.29%) in 2022 and 2023. The overall numbers at Hinkley Point Power Station are likely to have declined since 2016 due to the removal of roofing at HPA. A variety of deterrents have been deployed within the Works Area including netting, lasers, bioacoustics and anti-bird spikes, although these do not appear to have had a substantive effect on nest numbers. The displacement of a small and declining number of breeding territories from the Works Area is likely to have a negligible effect on the conservation status of the Ramsar population of lesser black-backed gull.

8.10.37. The wintering/passage waterbird assemblage includes wigeon, teal, mallard, shoveler, grey plover, lapwing, whimbrel, curlew, spotted redshank, ringed plover, herring gull, knot, black-headed gull, black-tailed godwit, pochard, turnstone, tufted duck, oystercatcher, dark-bellied brent goose, light-bellied brent goose and little egret. The baseline surveys recorded these species infrequently and/or in low numbers, or in elevated numbers only intermittently/occasionally, there is therefore likely to be low or infrequent use of the ZoI by these species. Given the temporary nature of the Proposed Works and low-level and or infrequent/intermittent utilisation of the ZoI by these species, the Proposed Works are unlikely to result in sustained loss of resource (feeding, roosting etc) for these species. There is therefore likely to be a negligible effect on the wintering/passage waterbird assemblage.

8.10.38. Overall, therefore, the Proposed Works are likely to have a negligible effect on the conservation status of habitats with Severn Estuary SPA/Ramsar and an effect on birds that are qualifying features of the SPA/Ramsar that is of no greater than very low magnitude. This likely to result in a **Neutral** effect on the integrity of the SPA and Ramsar site, which is **Not Significant**.

Somerset Levels and Moors SPA & Somerset Levels and Moors Ramsar

8.10.39. Somerset Levels and Moors SPA and Ramsar site is situated over 15 km from the Site and Works Area. The assessment of the predicted effects of the Proposed Works on bird species that are qualifying features of Somerset Levels and Moors SPA, and/or criteria for the designation of the Somerset Levels and Moors Ramsar site, and any associated effects on SPA/Ramsar integrity, are summarised below.

8.10.40. Bewick's swan and golden plover (SPA species) and Mute swan and shoveler (Ramsar) were not recorded by the baseline surveys. Teal and lapwing (SPA & Ramsar) were recorded in low numbers or infrequently. Wigeon (Ramsar) was recorded in relatively low numbers, equivalent to <1% of the comparable five-year peak average[99] (2015/16 - 2019/20) for the Severn Estuary. There is therefore likely to be negligible, limited or infrequent use of the ZoI by these species.

8.10.41. As set out above in relation to Severn Estuary SPA and Ramsar, the baseline surveys and also monitoring at the adjacent HPC, recorded occasional or intermittent peaks in pintail numbers, with numbers utilising the areas around HPB and HPC fluctuating substantively during different tidal phases, and across survey periods. Therefore, given the temporary and localised nature of the Proposed Works along the coast, any reduction in the utilisation of the ZoI by pintail is likely to result in no sustained loss of resource for this species.

[99] Peak average is the average of the annual peak count over a five-year period.

8.10.42. The Proposed Works are therefore predicted to have an effect on birds that are qualifying features of the SPA/Ramsar that is of no greater than very low magnitude and a **neutral** effect on the integrity of the SPA and Ramsar site, which is **Not Significant**.

Statutory Biodiversity Conservation Sites (national importance)

Preparations for Quiescence and Final Site Clearance

Bridgwater Bay SSSI

8.10.43. Bridgwater Bay SSSI is situated immediately adjacent to the Site and forms part of Somerset Wetlands NNR. Marine infrastructure within the Works Area, encompassing the CW outfall infrastructure, extends over marine/intertidal habitats within the SSSI/NNR. These are the same habitat areas that are within Severn Estuary SAC/SPA/Ramsar designations as set out above.

8.10.44. As set out above in relation to Severn Estuary SAC, decommissioning of CW infrastructure will take place predominantly at low tide and from within the existing concrete CW outfall channel. There will therefore be minimal disturbance of intertidal habitat within the SSSI. High levels of suspended sediment in the Severn Estuary mean that any localised seabed disturbance is not anticipated to result in an increased sediment load. This limited, temporary and localised disturbance is likely to have a negligible effect on the conservation status of habitats within the SSSI. There is also likely to be no degradation of SSSI habitats due to dust emissions from the Proposed Works and the predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats with Severn Estuary SPA/Ramsar.

8.10.45. The baseline surveys recorded ten bird species that are listed on the SSSI citation, including curlew, dunlin, knot, mallard, redshank, ringed plover, shelduck, teal, turnstone and wigeon.

8.10.46. As described above in relation to the effects of the Proposed Works on sites that are designated for bird assemblages that are of international importance, teal, wigeon, redshank, ringed plover and dunlin tend to occur within the ZoI infrequently and/or in low numbers. Knot was also recorded in relatively low numbers and in only one of the seven survey months. Peak counts of Curlew, mallard and turnstone reached 62, 47 and 25 respectively, which is equivalent to 1.9%, 2% and 5.2% of the comparable five-year peak average (2015/16 - 2019/20) for the Seven Estuary populations of these species. These peak counts were all recorded in September (autumn passage) and were substantively reduced in all other survey months. There is therefore likely to be limited or intermittent/infrequent use of the ZoI by these species.

8.10.47. As set out above, the works on the outfall are to be undertaken at low tide and at Hinkley Point, shelduck tend to aggregate at 500 m – 800 m from MLW and are likely to be subject to only low-level or negligible disturbance associated with works in the intertidal zone. In the event shelduck occur within 500m of onshore decommissioning works, and are temporarily disturbed, they would be able to move short distances to avoid disturbance with little energetic expenditure and this would be likely to have no detrimental effect on their longer-term survival.

8.10.48. Work on the intake structure would be undertaken in open water via pontoon. The structure is however >500 m to the west of grid squares where previous monitoring has reported aggregations of shelduck and the work is expected to utilise minimal vessel movements to facilitate the works. The risk of intake works disturbing aggregations of shelduck is therefore minimal.

8.10.49. There will therefore be only limited temporary and localised disturbance of mud and rock habitat within the SSSI and there is likely to be no degradation of habitats within the SSSI due to dust or

vehicle emissions associated with the Proposed Works. The Proposed Works are likely to result in no sustained loss of resource (feeding, roosting etc) for SSSI bird species. The Proposed Works are therefore predicted to have an effect on birds that are reasons for the notification of the SSSI that is of no greater than very low magnitude and a **neutral** effect on the integrity of the SSSI, which is **Not Significant**.

Somerset Wetlands NNR

8.10.50. Bridgwater Bay SSSI forms part of Somerset Wetlands NNR and the effects on the NNR and associated habitats and bird species, for example dunlin, knot, ringed plover and shelduck, are the same as the effects on the SSSI as described above.

8.10.51. The NNR is also noted as supporting numerous small birds such as reed warbler (*Acrocephalus scirpaceus*), sedge warbler (*Acrocephalus schoenobaenus*) and skylark. Other breeding birds include oystercatcher and avocet. Birds of prey include peregrine, merlin (*Falco columbarius*) and sparrowhawk (*Accipiter nisus*).

8.10.52. Breeding reed warbler (four territories) and skylark (two territories) were recorded by the baseline surveys and sedge warbler (one territory) has previously been recorded breeding within the Site. A single oystercatcher territory and a single sparrowhawk territory were also recorded. The Proposed Works are likely to result in negligible loss of habitat for these species. There is limited scope for the Proposed Works to displace small numbers of breeding territories of these species, however they would be able to occupy adjacent suitable habitat and the Proposed Works are likely to have a negligible effect on the conservation status of these species.

8.10.53. In 2022 and 2023 a pair of peregrine successfully nested on HPB and fledged young[100]. In previous years nesting was unsuccessful, which is likely to be due to the proximity to gull and rook colonies. The Proposed Works will therefore potentially displace a pair of peregrine from the Works Area. The displaced pair is however likely to find suitable, similar, alternative nesting habitat nearby, with other pairs of peregrine nesting on electricity towers nearby.

8.10.54. The baseline surveys recorded a peak count (68) of oystercatcher, which is equivalent to 6% of the comparable five-year peak average (2015/16 - 2019/20) for the Seven Estuary population. The peak count was recorded in September and numbers were reduced, typically by more than half, in other survey months. There is therefore likely to be limited or infrequent/intermittent use of the ZoI by this species. Given the temporary and localised nature of the Proposed Works along the coast, any reduction in the utilisation of the ZoI by oystercatcher is likely to result in no sustained loss of resource for this species.

8.10.55. Overall, therefore, there will be only limited temporary and localised disturbance of intertidal habitat within the NNR and there is likely to be no degradation of habitats within the NNR due to dust or vehicle emissions associated with the Proposed Works. The Proposed Works are likely to result in no sustained loss of resource (feeding, roosting, nesting etc) for NNR bird species. The Proposed Works are therefore predicted to have an effect on birds that are reasons for the declaration of the NNR that is of no greater than very low magnitude and a **neutral** effect on the integrity of the NNR, which is **Not Significant**.

[100] EDF (2023). The flight fantastic - Hinkley B rescued Peregrine starts anew. Online at: https://www.edfenergy.com/media-centre/news-releases/flight-fantastic-hinkley-b-rescued-peregrine-starts-anew

Other SSSIs

8.10.56. Ge-Mare Farm Fields SSSI (6.5 km south-west), The Quantocks SSSI (6.6 km south-west) and Berrow Dunes SSSI (8.8 km north-east) are all over 6 km from the Works Area and there is no pathway via which the Proposed Works are likely to have an effect on any of these sites. There are therefore likely to be no effects on any of other SSSIs.

Non-statutory biodiversity Conservation Sites

Preparations for Quiescence and Final Site Clearance

Habitat loss and degradation

8.10.57. The majority of Hinkley LWS is within the Site boundary, however the limited extent of the Works Area that is within the LWS is a small sewage treatment works, comprising hard standing and sewage treatment infrastructure. The Proposed Works are to be confined within the Works Area and there will be negligible removal or direct physical disturbance of habitats within the LWS. There are no other LWS within 1 km of the Site and/or Works Area and therefore there will be no loss of habitat with other LWSs.

8.10.58. As described above for statutory biodiversity sites, dust emissions associated with the Proposed Works could potentially smother vegetation, leading to deterioration in the conservation status of non-statutory biodiversity conservation sites. Dust emissions are most likely to affect ecological receptors within 0.05 km of the boundary of the Proposed Works and the route(s) used by mobile machinery, increasing to 0.25 km from the Site entrance for mobile machinery on the public highway.

8.10.59. The construction route passes through/immediately adjacent to Hinkley LWS and two other LWS, including Mud House Copse and Wick Park Covert, with the latter including Ancient Woodland. However, as set out in **Chapter 6: Air Quality** it is estimated that the Proposed Works will generate 30 outward Heavy Duty Vehicle movements in any one day and the potential dust emission magnitude associated with trackout is small, also recognising that vehicles within the Site and Works Area will continue to use existing roads, with only limited transit across unmade ground. Other dust emissions associated with the Proposed Works will be mitigated using standard good practice controls to be set out in a Dust Management Plan as described above. Dust deposition on non-statutory biodiversity conservation sites is therefore likely to be **Negligible**.

8.10.60. There will therefore be no physical removal/loss of habitat within or bordering non-statutory biodiversity conservation sites and there is likely to be negligible degradation of habitats within these sites due to dust. The magnitude of change in the conservation status of any non-statutory biodiversity conservation site is therefore likely to be **neutral** and **Not Significant**.

Habitat degradation (vehicle emissions)

8.10.61. As set out above for statutory biodiversity sites, emissions from HDVs and LDVs could potentially lead to degradation of vegetation within biodiversity conservation sites that are within 0.2 km. Increases in the baseline concentration of NOx and Ammonia can damage habitats within these sites.

8.10.62. The predicted change in traffic levels on the construction route, attributable to the Proposed Works (100 LDV AADT and 30 HDV AADT) is well below the threshold (1,000 AADT for LDVs and 200 AADT for HDVs) that triggers detailed assessment of effects on statutory sites of international

importance and therefore there are likely to be no significant effects on non-statutory sites, which are of county importance, or ancient woodland, which is of up to national importance.

8.10.63. The construction route passes through/immediately adjacent to Hinkley LWS and two other LWS, including Mud House Copse and Wick Park Covert, with the latter including Ancient Woodland. As set out above in relation to Severn Estuary SAC, although small areas of these LWS are within 0.025 km of the construction route, the predicted change in traffic flow is well below the level that would be likely to cause an increase in background concentration of NOx or Ammonia that is equivalent to >1% of CL at a distance of 0.025 km. It is reasonable to conclude therefore that the predicted increase in road traffic emissions is likely to have a negligible effect on the conservation status of habitats within LWSs and a **neutral** effect on LWSs that is **Not Significant**.

Habitats and plants

Preparations for Quiescence and Final Site Clearance

8.10.64. The approximate extent of each habitat type within the Works Area is summarised in **Table 8-19.** The majority (c.18.5 ha) of the Works Area is buildings, hardstanding and bare ground. Amenity grassland covers approximately a further 0.2 ha of the Works Area and is also of negligible intrinsic biodiversity conservation importance. The other habitat types within the Works Area occur in very small, localised areas.

8.10.65. The habitats adjacent to the Works Area and within the wider Site predominantly comprise broadleaved woodland (semi-natural and plantation), dense/continuous scrub, tall ruderal vegetation and semi-improved grassland. This mosaic of habitats extends throughout Hinkley LWS and is therefore of biodiversity conservation importance at a county-level. There will however be no loss of habitat within the LWS and no loss of habitat types qualifying as Habitat of Principal Importance for Biodiversity Conservation. Embedded environmental measures, to be implemented through the EMP, for example dust control measures, will minimise the risk of habitat degradation outside of the Works Area.

8.10.66. The Proposed Works are to be confined within the Works Area and mainly within hardstanding, with vegetation being retained wherever practicable. Biosecurity measures will be implemented during the Proposed Works to limit the risk of spreading invasive non-native species into surrounding habitats.

8.10.67. Any unavoidable damage to or loss of habitat within or immediately adjacent to the Works Area would therefore be limited to small areas of habitat that are of no greater than local biodiversity conservation importance and this would have a **neutral** effect on the conservation status of each habitat type within the Works Area and therefore **no significant effects** on any habitat types are anticipated.

Table 8-19 - Habitat cover within the Works Area

Habitat	Area (ha)
Hardstanding	13.2
Buildings	5.2
Bare ground	0.1
Amenity grassland	0.2
Broad-leaved plantation	0.04
Tall ruderal	<0.001
Swamp	0.001
Dense continuous scrub	0.06
Semi-improved neutral grassland	<0.001
Introduced shrub	0.02

Bats

Preparations for Quiescence and Final Site Clearance phases

8.10.68. Bat activity (foraging/commuting) attributable to at least 11 species was recorded within the Site: Natterer's, Daubenton's, common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared, noctule, Leisler's bat, barbastelle, greater horseshoe and lesser horseshoe.

8.10.69. A tree within approximately 50 m of the Works Area was confirmed as a bat roost (species unconfirmed) potentially used by individual bats or small groups of males occasionally, which is typical of common and soprano pipistrelle. No other bat roosts were recorded by the baseline surveys, however species previously recorded roosting within the Site, around the perimeter of the Works Area, in bat boxes include common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, brown long-eared bat, Natterer's bat, noctule and Leisler's bat.

8.10.70. All of the recorded bat species are EPS and some are species of Principal Importance for biodiversity conservation. Large roosts or aggregations of these species are therefore of national, and potentially up to international, biodiversity conservation importance. The baseline status of each of the recorded species is reported separately (**Appendix 8E**) and briefly summarised below (**Table 8-20**).

Table 8-20 - Status of bat species within the Site

Species	Baseline (summary)
Common pipistrelle	Frequently roosts in buildings. No roosts were recorded by the baseline surveys. Small numbers (typically <10 and sometimes including juveniles) are recorded annually in bat boxes within the Site (outside of the Works Area). The most abundant bat species recorded at the Site, a common species in Somerset[101] and one of the most common and widespread bat species in the UK and, following previous declines, populations appear to be increasing. The Site is therefore likely to be of no greater than **Local** importance for biodiversity conservation.
Soprano pipistrelle	Frequently roosts in buildings, however no roosts were recorded in buildings by the baseline surveys. A suspected soprano pipistrelle roost was recorded in a fissure in a tree trunk within approximately 50m of the Works Area. Small numbers roost almost annually in bat boxes within the Site (outside of the Works Area). Seven pregnant soprano pipistrelles captured within a 2.5-hour period close to the Works Area signifies that a maternity roost is likely to be within 3 km. The second most abundant bat species recorded at the Site. It is a Species of Principal Importance for Biodiversity Conservation; however, it is common in Somerset, one of the most common and widespread bat species in the UK and, following previous declines, populations appear to be increasing. The soprano pipistrelle population that utilises the Site is therefore likely to be of no greater than **Local** importance for biodiversity conservation.
Nathusius' pipistrelle	Often roosts in buildings, fissures in rocks and tree hollows, however no roosts were recorded by the baseline surveys. This species (a single bat) was previously recorded roosting in a bat box within the Site (outside of the Works Area) in 2012. A migratory species, mostly recorded in autumn, although it is resident and breeds in the UK. During the baseline surveys it was recorded in low numbers, mainly in late summer and autumn, which is comparable with monitoring data collected within the wider area around HPC[102]. It is however rare in Somerset[101] and a rare species in the UK, with sparse records, albeit increasing. The Nathusius' pipistrelle population that utilises the Site is therefore concluded to be of up to **County-level** importance for biodiversity conservation on a precautionary basis.
Noctule	Typically roosts in rot holes and woodpecker holes in trees. No roosts were recorded by the baseline surveys and this species is rarely (single noctule in 2014) recorded in bat boxes within the Site (outside of the Works Area). Low levels of noctule activity were recorded by the baseline surveys. It is a species of Principal Importance for the Conservation of Biodiversity that is common in Somerset and relatively widespread in the UK, although it has become scarce in some areas. The noctule population that utilises the Site is therefore concluded to be of up to **County**-level importance for biodiversity conservation on a precautionary basis.

101 https://somersetbat.group/bats/somerset/ (Accessed March 2024).

102 NNB GenCo (HPC) Ltd. Hinkley Point C Annual Ecological Monitoring Reports: Main Site (2017 - 2022).

Species	Baseline (summary)
Brown long-eared	Roosts in trees and buildings, however no roosts were recorded by the baseline surveys. Individual bats and/or droppings have occasionally been recorded in bat boxes within the Site (outside of the Works Area). Low levels of Plecotus sp. activity recorded at the Site are likely to be partly attributable to this species. It is a species of Principal Importance for the Conservation of Biodiversity that is common in Somerset and relatively widespread in the UK, albeit it has declined. The brown long-eared bat population that utilises the Site is therefore concluded to be of up to **County**-level importance for biodiversity conservation on a precautionary basis.
Leisler's	A woodland species that often roosts in tree holes, as well as buildings, however no roosts were recorded by the baseline surveys. It has occasionally been recorded in bat boxes within the Site (outside of the Works Area). Low levels of Leisler's bat activity were recorded at the Site, however it is likely that Leisler's bat activity also contributed to the recorded activity of other bats, recognising that Leisler's bats are often not readily distinguishable from other Nyctalus sp and/or Serotine. It is a rare species in Somerset and the UK and the Leisler's population that utilises the Site is concluded to be of up to **County**-level importance for biodiversity conservation on a precautionary basis.
Daubenton's	Tends to roost in humid, underground, sites near water (e.g. tunnels or bridges and caves, mines and cellars). Occasionally found in buildings, often old stone structures and waterworks. Tree-roosts may be under-recorded. No roosts were recorded by the baseline surveys, however the capture of a post-lactating bat within the Site (outside of the Works Area) in late August, signifies the presence of a maternity colony, which is likely to be within 2 km. Low levels of Daubenton's bat activity were recorded within the Site throughout the baseline surveys. It is common in Somerset and a widespread species in the UK, with populations increasing in parts of its range. The Daubenton's bat population that utilises the Site is therefore concluded to be of **Local** importance for biodiversity conservation.
Natterer's	Most summer roosts are recorded in old stone buildings. No roosts were recorded by the baseline surveys and this species seldom roosts in bat boxes within the Site (single record in 2012). It has been recorded in roosts to the west, associated with HPC. A juvenile male bat trapped within the Site in July potentially signifies the presence of a maternity colony within 4 km. It is likely that Natterer's bat activity, along with Daubenton's bat activity, contribute to Myotis sp. activity recorded within the Site. It is a scarce, poorly known species that is widespread in the UK, which supports populations of international importance. It is however uncommon and not necessarily rare in Somerset. On a precautionary basis, the Natterer's bat population that utilises the Site is concluded to be of **County-level** importance for biodiversity conservation.
Lesser horseshoe	Summer colonies are found in buildings. No roosts were recorded by the baseline surveys. Low levels of lesser horseshoe bat activity were recorded within the Site, with relative peaks in activity in October and September potentially signifying a mating area nearby.

Species	Baseline (summary)
	A species of Principal Importance for Biodiversity Conservation that is uncommon in Somerset and rare in the UK. It is confined to Wales and Western England and has exhibited a decline in population and distribution, although there is evidence of a recent increase in numbers in Wales. On a precautionary basis, the lesser horseshoe bat population that utilises the Site is concluded to be of up to **National** importance for biodiversity conservation.
Greater horseshoe	Hibernates in caves, disused mines, cellars and tunnels; few use caves in summer; and breeding females mainly use buildings. No roosts were recorded by the baseline surveys. Low levels of greater horseshoe bat activity were recorded within the Site, typically one or two records each month. It is a species of Principal Importance for the Conservation of Biodiversity that has been subject to a steep decline and is now rare and confined to south-west England and south Wales, also being uncommon in Somerset. On a precautionary basis, the greater horseshoe bat population that utilises the Site is concluded to be of up to **National** importance for biodiversity conservation.
Barbastelle	Roosts in buildings, trees and underground sites/caves. No roosts were recorded by the baseline surveys. Low levels of barbastelle bat activity were recorded within the Site. A species of Principal Importance for the Conservation of Biodiversity and a rare species that is found in central and southern England, as well as Wales. It is also rare in Somerset. The Site is at the edge of a CSZ that extends around barbastelle roosts within Exmoor and Quantock Oakwoods SAC, with this species being a primary reason for the selection of the SAC. It is feasible therefore that barbastelles from the SAC could visit the Site. On a precautionary basis, the Barbastelle population that utilises the Site is concluded to be of up to **International** importance for biodiversity conservation. This is highly precautionary, recognising that the Site is at the outer edge of the CSZ around roosts within the SAC.

8.10.71. The majority of the built structures within the Works Area are of negligible or low suitability for roosting bats, being of modern construction, lacking obvious potential roost features, with poor connectivity to surrounding semi-natural habitats and prone to disturbance from noise and artificial lighting, as well as being used by gulls. There are a small number of buildings within the Works Area that are of Moderate suitability for roosting bats, however no bat roosts were recorded in any of the buildings. Similarly, there are no trees within the Works Area that are likely to be suitable for roosting bats. The Proposed Works will therefore not result in loss or physical disturbance of bat roosts.

8.10.72. The Works Area is also of low to negligible suitability for bats more generally, predominantly comprising hard standing and bare ground, illuminated extensively by artificial lighting and lacking semi-natural habitats that are favoured by foraging/commuting bats.

8.10.73. Wooded areas outside of the Works Area include suitable bat roost habitat, including trees and approximately 60 bat boxes. The bat boxes tend to be used by small numbers of common species and the majority are well over 250m to the west of the Works Area and will not be disturbed. There are a small number of bat boxes (<10), plus a tree that was previously identified as a bat roost, at

the eastern edge of the Site, within approximately 50m of the Works Area. The majority of the boxes and the tree are however over 20m from the Works Area and shielded from it by trees/woodland. The Proposed Works are therefore unlikely to disturb bats that roost outside of the Works Area.

8.10.74. The semi-natural habitats within the wider Site, bordering the Works Area in places, incorporate semi-improved grassland, tall ruderal vegetation, standing water (ponds/ditches), woodland and scrub, as well as mosaics of these habitat types. These habitats are of high suitability for foraging and commuting bats. The embedded environmental measures to be implemented through the EMP, for example dust control measures, will minimise the risk of habitat degradation outside of the Works Area.

8.10.75. The Works Area is illuminated extensively by artificial lighting and there is therefore only limited potential for disturbance of bat habitats through changes in artificial lighting around the perimeter of the Works Area. This effect is likely to be localised however, displacing only small numbers of bats into immediately adjacent and more suitable habitats.

8.10.76. Overall, therefore, the Proposed Works are likely to result in no loss or disturbance of bat roosts, limited loss of habitat that is of low to negligible suitability for foraging/commuting bats and limited displacement of small numbers of foraging and commuting bats into immediately adjacent habitats. On this basis, and in light of the embedded measures outlined in **Table 8-14**, the effect of habitat loss/disturbance during the proposed works on the conservation status of any bat population will be of **Very Low** magnitude and **Not Significant**.

Badger

Preparations for Quiescence and Final Site Clearance phases

8.10.77. Badger is a common and widespread species and the badger population that utilises the Site and surrounding area is likely to be of no greater than local biodiversity conservation importance.

8.10.78. The habitats within the Works Area are predominantly buildings, hardstanding and managed grassland and are well illuminated in places, and subject to noise disturbance from operational machinery. The Works Area is therefore poor badger habitat and is likely to be seldom used by this species.

8.10.79. The embedded measures set out in **Table 8-14** include measures to protect badger and to minimise any risk of failure to comply with legislation relating to badgers.

8.10.80. The Proposed Works will therefore result in negligible loss of badger habitat and are likely to have a **Neutral** effect on the conservation status of badger that is **Not Significant**.

Birds (breeding)

Preparations for Quiescence

8.10.81. The breeding bird surveys recorded low numbers of common and widespread species that are typical of Somerset. Eight species recorded breeding (or potentially breeding) are of notable importance for biodiversity conservation i.e. listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended); qualifying species of the Severn Estuary Special Protection Area and/or Ramsar site; included on the Birds of Conservation Concern (BoCC) Red List; and/or Species of Principal Importance for Biodiversity Conservation. These species reflect the habitat types (scrub, trees, hedgerows and buildings) within the Site and perimeter areas and include Cetti's warbler; herring gull, lesser black-backed gull; peregrine, dunnock, linnet, skylark and song thrush. Annual

monitoring to inform the HPB Land Management Annual Reviews (LMARs) also recorded marsh tit (P*oecile palustris*), a BoCC red list species and Species of Principal Importance for Biodiversity Conservation.

8.10.82. The embedded measures (see **Table 8-14**) will minimise the risk of harming breeding birds or damaging their active nests or eggs in compliance with the legal protection of all native bird species in the UK. Birds are therefore unlikely to be harmed, however they are likely to be displaced due to loss of nesting habitat and/or noise, vibration, lighting and visual disturbance.

Cetti's Warbler

8.10.83. Cetti's warbler is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and is therefore afforded additional legal protection from disturbance during the breeding season. The UK breeding population of Cetti's warbler was estimated to be 2,000 pairs during 2006-10[103]. The species is widespread in Somerset during the breeding season, with 210 pairs/territories reported in 2016 (Holling, 2018). This is however likely to be an under-estimate of the true population in the county due to the extensive areas of suitable (wetland scrub) habitat available and with Somerset Ornithological Society reporting sightings increasing from 78 in 2012 to 748 in 2022[104].

8.10.84. Two territories of Cetti's warbler were recorded in Hinkley LWS, associated with areas of scrub outside the Site, within the southern part of the Study Area and are likely to represent less than 1% of the county (Somerset) population. The breeding Cetti's warbler are therefore likely to be of no greater than County-level biodiversity conservation importance.

8.10.85. The Proposed Works are to be confined within the Works Area, which is almost entirely hardstanding, bare ground and buildings. Cetti's warbler inhabit dense vegetation, such as scrub and reedbed and there will therefore be no loss of Cetti's warbler habitat. Any breeding Cetti's warbler territories that are displaced from the perimeter of the Works Area are likely to disperse into alternative suitable habitats in other parts of Hinkley LWS. The displacement of a small number of breeding territories is therefore likely to have an effect of **Very Low** magnitude on the conservation status of this species, which is **Not Significant**.

Peregrine

8.10.86. Peregrine is listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and Annex I of the Birds Directive. During the last full census of the species in 2014, a total of 1,694 pairs were estimated for the UK and Isle of Man (Wilson et al. 2018) of which 11 were in Somerset (Holling, 2016).

8.10.87. The baseline surveys recorded a pair of peregrine within the vicinity of the Site sporadically in 2019 (April-July). In 2022 and 2023 a pair of peregrine successfully nested on HPB and fledged young[100]. In previous years nesting was unsuccessful, which is likely to be due to the proximity to gull and rook colonies. Peregrine nesting at HPB are likely to be of up to County-level biodiversity conservation importance.

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103 Eaton MA, Aebischer NJ., Brown AF., Hearn R., Lock L., Musgrove AJ., Noble DG., Stroud D. and Gregory R.D (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. British Birds 108, pp 708–746

104 Somerset Ornithological Society (2023). Somerset Birds 2022. 109th Report.

8.10.88. The Proposed Works will potentially displace a pair of peregrine from the Works Area. The displaced pair is however likely to find suitable, similar, alternative nesting habitat nearby, with other pairs of peregrine nesting on electricity towers nearby. This displacement is likely to have an effect of **Very Low** magnitude on the conservation status of peregrine, which is **Not Significant**.

Herring Gull

8.10.89. Herring gull is a SPI and BoCC red-listed species, reflecting a severe decline in the UK breeding population[52], with the natural-nesting[105] population estimated at 140,000 pairs during 1998-2002[103] and the latest census of breeding seabirds indicating a continuing decline to around 61,000 pairs[106].

8.10.90. The latest census recorded an estimated 1,420% increase in the natural-nesting herring gull population (380 pairs) in Somerset, with a mean annual change of 18.5%. The census also derived combined estimates of urban, as well as natural nests, concluding that the UK nesting population is around 230,000.

8.10.91. Subsequent to the baseline surveys in 2019, annual gull monitoring at Hinkley Point B (2020 to 2023)[98] has recorded a stable nesting population, with 186 pairs recorded in 2020, 191 in 2021, 189 in 2022 and 185 in 2023 (WSP 2023). This is less than 0.1% of the estimated UK nesting population, however the nesting population within The Works Area is of up to County-level biodiversity conservation importance.

8.10.92. Despite a variety of bird deterrents being deployed, herring gulls nest on large flat roofs within the Works Area, with the presence of these nests potentially also partly attributable to the availability of prey at the grate/screen over the water intake. The removal of buildings will reduce the available nesting habitat for herring gull and, combined with the decommissioning of marine infrastructure, potentially displace approximately 190 pairs of gulls. A variety of deterrents have been deployed within the Works Area including netting, lasers, bioacoustics and anti-bird spikes, although these do not appear to have had a substantive effect on nest numbers.

8.10.93. It is reasonable to conclude that the gulls will be displaced to alternative large flat roofs in the wider area surrounding HPB, with HPC potentially providing additional nesting sites once it has been constructed. The Proposed Works are likely to have an adverse effect of **Low** magnitude on the conservation status of herring gull and this effect is **Not Significant**.

Other notable bird species

8.10.94. The number of breeding territories of other bird species of biodiversity conservation concern recorded within the Site is relatively small: dunnock (6), linnet (2), skylark (2) and song thrush (3). The Proposed Works are mainly confined to hard standing within the Works Area and any unavoidable damage to, or loss of, nesting habitat within the Works Area would be limited to small areas of habitat. A small number of these breeding territories are likely to be displaced and re-established in nearby suitable habitat. The Proposed Works are therefore likely to have **Very Low** effect on the conservation status of all four species, which is **Not Significant**.

105 'Natural-nesting' refers to nesting on moors, cliffs, marshes, beaches and other areas of semi-natural habitat, while 'urban-nesting' is defined as on human-built structures.

106 Burnell D., Perkins, A.J., Newton S.F., Bolton, M., Tierney, T.D. & Dunn, T.E (2023). Seabirds Count: A census of breeding seabirds in Britain and Ireland (2015-2021). Lynx Nature Books, Barcelona.

Quiescence

8.10.95. Embedded environmental measures to protect birds (**Table 8-14**) will continue to be implemented during routine site maintenance. A substantial reduction in disturbance of the Works Area and perimeter areas during the Quiescence phase is likely to increase the numbers of breeding bird territories in surrounding areas and have a beneficial effect of up to Very Low magnitude on the conservation status of dunnock, linnet, skylark, song thrush, Cetti's warbler and herring gull. These effects are likely to be Not Significant.

Final Site Clearance

8.10.96. Embedded environmental measures (**Table 8-14**) will continue to be implemented to protect birds during Final Site Clearance. The erection and subsequent removal of temporary structures will potentially establish and then displace no more than a very small number of nesting herring gull territories. This is likely to have an effect of Very Low magnitude on the conservation status of herring gull, which is Not Significant.

8.10.97. The erection and subsequent removal of temporary structures could similarly establish and then displace nesting peregrine territory. The effect on the conservation status of peregrine is likely to be similar to the effects of the Preparations for Quiescence phase and be of Very Low magnitude and Not Significant.

8.10.98. The Proposed Works are confined to hard standing within the Works Area and any unavoidable damage to, or loss of, breeding bird habitat within the Works Area would be limited to small areas of habitat and there is likely to be negligible loss of nesting habitat for dunnock, linnet, skylark, song thrush and Cetti's warbler and limited displacement of small numbers of each species into suitable surrounding habitats. This phase is therefore likely to have an effect of Very Low magnitude on the conservation status of these species, which is Not Significant.

Birds (wintering / passage)

Preparations for Quiescence

8.10.99. The assessment of effects of the Proposed Works on the assemblages of wintering and passage birds that are the reasons for the designation of the statutory biodiversity conservation sites are set out separately above. There are likely to be no significant effects on those assemblages.

8.10.100. The baseline surveys of wintering and passage birds recorded other species infrequently or in small numbers, including for example four species that are listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended): a foraging kingfisher; a barn owl (*Tyto alba*) flying along the foreshore; a pair of peregrine foraging in the air or on rock beds; and a migrating osprey (*Pandion haliaetus*). None of the other recorded species occur regularly enough, or in sufficient numbers, within the Survey Area over the winter to be considered populations or assemblages of greater than local biodiversity conservation importance.

8.10.101. The Proposed Works are mainly confined to hard standing within the Works Area and any unavoidable damage to, or loss of, wintering/passage bird habitat within the Works Area would be limited to small areas of habitat.

8.10.102. Wintering and passage birds are likely to be displaced due to noise, vibration, lighting and visual disturbance associated with the Proposed Works. Disturbance effects are estimated to extend up to approximately 250 m from the Works Area, based on a precautionary approach and the likely

disturbance distance of breeding birds[107]. The bird species within the Study Area are highly mobile and will readily disperse into other terrestrial and intertidal habitat adjoining the Works Area, without substantive loss of fitness.

8.10.103. The displacement of assemblages of wintering/passage bird species that are of up to local biodiversity conservation importance, into similar adjacent coastal/terrestrial habitats, is likely to have an adverse effect of **Very Low** magnitude on the conservation status of each of these species, which is **Not Significant**.

Quiescence

8.10.104. The substantial reduction in disturbance of the Works Area is likely to increase the numbers of wintering and passage birds within the Site and adjacent areas. This is likely to have a beneficial effect of **Very Low** magnitude on the conservation status of wintering and passage bird species populations/assemblages that are of no greater than local biodiversity conservation importance and is therefore **Not Significant**.

Final Site Clearance

8.10.105. The effects of Final Site Clearance are likely to be similar to those of Preparation for Quiescence, albeit reduced in magnitude. The Proposed Works are mainly confined to hard standing and any unavoidable damage to, or loss of, wintering/passage bird habitat within the Works Area would be limited to small areas of habitat.

8.10.106. Habitat loss and displacement of assemblages of wintering/passage bird species that are of up to local biodiversity conservation importance, into similar adjacent coastal/terrestrial habitats, is likely to have an adverse effect of **Very Low** magnitude on the conservation status of each of these species, which is **Not Significant**.

Reptiles

Preparations for Quiescence and Final Site Clearance phases

8.10.107. The baseline surveys recorded low populations of both slow worm and grass snake. Both species are legally protected and SPI, however they remain relatively common and widespread in the south-west of England. The populations are therefore likely to be of no greater than county-level biodiversity conservation importance.

8.10.108. The survey recorded a concentration of slow worms to the south-west of the Works Area, associated with areas of tall ruderal vegetation and scattered scrub, and grass snake was recorded approximately 95m south-east of the Site, adjacent to the Works Area (sewage works).

8.10.109. The Proposed Works are to be confined to the Works Area, which is largely devoid of suitable habitat for reptiles and there is therefore likely to be negligible loss of reptile habitat. These species could however be subjected to harm due to site clearance activities. The embedded measures outlined in **Table 8-14** therefore include precautions to avoid harming reptiles, also ensuring compliance with the legislation relating to these two species. The Proposed Works are therefore likely to have an effect of **Very Low** magnitude on the conservation status of slow worm and grass snake populations that is **Not Significant**.

[107] Ruddock, M and Whitfield, D.P. (2007). A Review of Disturbance Distances in Selected Bird Species. A report from Natural Research (Projects) Ltd to Scottish Natural Heritage

8.11 Assessment of cumulative effects

Inter-project effects

8.11.1. There is the potential for terrestrial biodiversity and ornithology effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

8.11.2. An assessment inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-project effects

8.11.3. The assessment has inherently considered the potential impacts of noise, air quality, and water on sensitive biodiversity receptors.

8.11.4. A summary of the potential intra-project effects is provided in **Chapter 21: Cumulative Effects Assessment**.

8.12 Summary

8.12.1. The assessment of the effects of the Proposed Works on terrestrial biodiversity are summarised in **Table 8-21**.

8.12.2. The effects of the Proposed Works on invertebrate assemblages are assessed as part of the assessment of effects on Hinkley LWS, which supports the main invertebrate interest at the Site.

8.12.3. The assessment of effects of the Proposed Works on marine biodiversity, including sites that are designated for the conservation of marine taxa and migratory freshwater fish are set out in **Chapter 9: Marine Biodiversity.**

8.12.4. The potential effects of the Proposed Works on European designations are also the subject of a Habitats Regulations Assessment (HRA), which is detailed further in the separate HRA Screening Report.

Table 8-21 - Summary of predicted effects

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Severn Estuary SAC	Disturbance and degradation of intertidal habitats such as mudflats.	International	Neutral	Not Significant	There will be only limited, localised and temporary disturbance of intertidal habitat within the SAC. Embedded measures will minimise dust mobilisation and dust deposition on SAC habitats. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats within the SAC.
Exmoor and Quantock Oakwoods SAC	Loss or severance of habitats (roosting, foraging, commuting) used by barbastelle bat, Bechstein's bat and otter, and/or harm to these species, and associated effects on the conservation status of SAC populations of these species	International	Neutral	Not Significant	The Site is at the outer edge of the 6 km CSZ around barbastelle roosts in the SAC. No barbastelle roosts were recorded within the Works Area and levels of barbastelle activity within the Site are low. The Proposed Works will take place within hard standing, with negligible loss of habitat that is of low suitability for bats. The Proposed Works are therefore likely to have a negligible effect on the conservation status of barbastelle. The Site is likely to be beyond the CSZ (1 km) of Bechstein bats that roost in the SAC. There are no confirmed records of Bechstein's bat within the Site. The Proposed Works are likely to have a negligible effect on the conservation status of Bechstein bats. Otter was not recorded by the baseline surveys and the Works Area lacks suitable otter habitats.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Severn Estuary SPA & Severn Estuary Ramsar	Disturbance of coastal habitats and displacement of birds, leading to sustained loss of feeding and roosting resource, with adverse effects on the conservation status of SPA/ Ramsar species populations and assemblages.	International	Neutral	Not Significant	There will be only limited, localised and temporary disturbance of intertidal habitat within the SPA/Ramsar. Embedded measures will minimise dust mobilisation and dust deposition on SPA/Ramsar habitats and the predicted increase in road traffic emissions is well below the threshold that is likely to have an effect on the conservation status of habitats with the SPA/Ramsar. There are likely to be no effects on core roosts of moulting shelduck. Shelduck aggregations in grid squares within 500m of the Works Area exceed 1% of the SPA population, with peak counts aggregating on the water over two hours either side of the high tide period. These 'rafting' birds were not recorded foraging and did not tend to remain in the same areas for long. Work on the outfall will be at low tide, avoiding the most sensitive high tide periods and limiting shelduck disturbance. Any shelduck that remain within 500m of the Works Area are likely to disperse short distances to other areas of open water with little energetic expenditure. The intake structure is >500 m west of grid squares where shelduck aggregations have been reported. Work on this structure will employ minimal vessel movements, with minimal risk of disturbing shelduck aggregations. Works within the marine environment will also be scheduled as far as reasonably practicable outside the period July to September, avoiding core shelduck moulting periods. Other SPA/Ramsar species were recorded infrequently or in low numbers or exhibited intermittent/short-term peaks in numbers. There is therefore likely to be low or infrequent use of the ZoI by these species.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					The Proposed Works are therefore likely to result in no sustained loss of resource (feeding, roosting etc) for these species.
Somerset Levels and Moors SPA & Somerset Levels and Moors Ramsar	Disturbance of coastal habitats and displacement of birds, leading to sustained loss of feeding and roosting resource, with adverse effects on the conservation status of SPA/ Ramsar species populations and assemblages.	International	Neutral	Not Significant	Somerset Levels and Moors SPA and Ramsar site is over 15 km from the Works Area. SPA/Ramsar species were either not recorded by the baseline surveys (e.g Bewick's swan, golden plover, mute swan and shoveler), were recorded infrequently or in low numbers (teal, lapwing, wigeon), or exhibited intermittent/short-term peaks in numbers (pintail). There is therefore likely to be limited or infrequent use of the ZoI by these species. The Proposed Works are therefore likely to result in no sustained loss of resource (feeding, roosting etc) for these species.
Bridgwater Bay SSSI	Habitat loss/degradation; and displacement of birds, leading to sustained loss of feeding and roosting resource, with adverse effects on the conservation status of SSSI species populations and assemblages	National	Neutral	Not Significant	There will be only limited, localised and temporary disturbance of intertidal habitat within the SSSI. Embedded measures will minimise dust mobilisation and dust deposition on SSSI habitats. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats within the SSSI. Ten bird species that are listed on the SSSI citation were recorded infrequently or in low numbers (teal, wigeon, redshank, ringed plover, dunlin and knot), or exhibited intermittent/short-term peaks in numbers (curlew, mallard and turnstone). There is therefore likely to be limited or infrequent use of the ZoI by these species.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					Work on the outfall is to be undertaken at low tide and any remaining aggregations of shelduck are likely to disperse short distances into other areas of open water. The Proposed Works are therefore likely to result in no sustained loss of resource (feeding, roosting etc) for these species.
Somerset Wetlands NNR	Habitat loss/degradation; and displacement of birds, leading to sustained loss of feeding and roosting resource and/or displacement of breeding territories, with adverse effects on the conservation status of NNR species populations and assemblages,	National	Neutral	Not Significant	Bridgwater Bay SSSI forms part of Somerset Wetlands NNR and the effects on the NNR and associated bird species, for example dunlin, knot, ringed plover and shelduck, are the same as the effects on the SSSI. There is limited scope for the Proposed Works to displace breeding territories of bird species associated with the NNR (e.g. reed warbler, skylark, sedge warbler, oystercatcher, peregrine and sparrowhawk), however no more than a small number of breeding territories would be affected and would be displaced into suitable adjacent habitat. The Proposed Works will potentially displace aggregations of oystercatcher, however peak numbers of this species within the ZoI are intermittent, with relatively low numbers recorded in most wintering/passage months. The oystercatcher are likely to disperse to alternative feeding/roosting habitats along the coast. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats within the NNR.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Other SSSIs (Ge-Mare Farm Fields SSSI; The Quantocks SSSI; and Berrow Dunes SSSI)	Habitat degradation due to air quality effects	National	Neutral	Not Significant	Ge-Mare Farm Fields SSSI (6.5 km south-west), The Quantocks SSSI (6.6 km south-west) and Berrow Dunes SSSI (8.8 km north-east) are all over 6 km from the Works Area and this distance means that there is no pathway via which the Proposed Works are likely to have an effect on any of these sites.
Non-statutory biodiversity conservation sites	Habitat loss and/or degradation due to air quality effects, and associated decline in the conservation status of species populations and assemblages (e.g. plants and invertebrates)	County	Neutral	Not Significant	There will be no removal or direct physical disturbance of habitats within any LWS and a negligible effect on the associated species (e.g. plants and invertebrates). Embedded measures will minimise dust deposition on LWSs in particular Hinkley LWS. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats with any LWS.
Habitats	Habitat loss and/or degradation due to air quality effects, and associated decline in the conservation status of associated species populations and assemblages (e.g. plants and invertebrates)	Local	Neutral	Not significant	The Proposed Works are mainly confined to hard standing. Any unavoidable habitat loss will be limited to small areas of habitat types that are common and widespread. Embedded measures will limit the risk of importing or spreading invasive non-native species. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats.
Bats (barbastelle)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting	International	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
	bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime				are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.
Bats (greater horseshoe and lesser horseshoe.)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime	National	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.
Bats Natterer's, Nathusius' pipistrelle, Leisler's, brown long-eared and noctule)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime	County	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Bats (common pipistrelle, soprano pipistrelle, and Daubenton's)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime	Local	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.
Breeding birds (Cetti's warbler)	Habitat disturbance, and displacement of breeding territories	County	Very Low (adverse)	Not Significant	There is limited scope for Preparations for Quiescence and Final Site Clearance to disturb and displace a small number of breeding Cetti's warbler territories from the perimeter of the Works Area and into suitable alternative habitats in other parts of Hinkley LWS. This is likely to have a negligible effect on the conservation status of Cetti's warbler.
Breeding birds (Peregrine)	Habitat loss and disturbance and displacement of breeding territories	County	Very Low (adverse)	Not Significant	Preparations for Quiescence and/or Final Site Clearance will potentially displace a pair of peregrine from the Works Area, with associated loss of nesting habitat (buildings). The displaced pair is however likely to find similar, suitable, alternative nesting habitat nearby and this displacement is likely to have a negligible effect on the conservation status of peregrine.
Breeding birds (herring gull)	Habitat loss and disturbance and displacement of breeding territories	County	Low (adverse)	Not Significant	The removal of buildings, combined with decommissioning of marine infrastructure, during the Preparations for Quiescence and/or Final Site Clearance Phase will reduce the available nesting habitat for herring gull and potentially displace

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					approximately 190 pairs of gulls. It is reasonable to conclude that the gulls will be displaced to alternative large flat roofs in the wider area surrounding HPB, with HPC potentially providing additional nesting sites once it has been constructed.
Breeding birds (dunnock, linnet, skylark, song thrush)	Habitat loss and disturbance and displacement of breeding territories	Local	Very Low (beneficial)	Not Significant	Preparations for Quiescence and Final Site Clearance will potentially lead to temporary displacement of a small number of breeding territories of birds that are of local biodiversity conservation importance. The longer Quiescence phase will lead to a substantive reduction in disturbance within the Works Area, potentially enhancing nesting opportunities in adjacent areas.
Wintering and passage birds	Habitat loss and disturbance, and displacement of wintering and passage bird species and assemblages	Local	Very Low (adverse)	Not Significant	The assessment of effects of the Proposed Works on assemblages of wintering and passage birds that are reasons for the designation of statutory biodiversity conservation sites are summarised above. The baseline surveys of wintering and passage birds recorded other species infrequently/intermittently or in small numbers. Preparations for Quiescence and Final Site Clearance will lead to temporary displacement of small assemblages of birds that are of local biodiversity conservation importance. The longer Quiescence phase will lead to a substantive reduction in disturbance within the Works Area, potentially enhancing foraging/roosting opportunities in adjacent areas.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Reptiles (grass snake & slow worm)	Loss of reptile habitat and harm and/or displacement of grass snake and/or slow worm	County	Very Low (adverse)	Not Significant	The Proposed Works are to be confined within the Works Area, which is largely devoid of suitable habitat for reptiles. There is likely to be negligible loss of reptile habitat. The Proposed Works include embedded measures that will minimise the risk of harming reptiles.

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Marine biodiversity

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9 Marine biodiversity

9.1 Introduction

9.1.1. This chapter presents the baseline and the assessment of likely significant impacts on marine biodiversity associated with the Proposed Works. It describes the key marine ecological receptors which occur in the vicinity of the Indicative Dismantling Works Area (hereafter referred to as the "Works Area") and considers the sensitivity of these receptors. The chapter also describes the embedded measures which will be taken to avoid, prevent, and reduce potential effects of the Proposed Works on marine ecological receptors (**Section 9.7**).

9.1.2. This chapter should be read in conjunction with the description of the Proposed Works as presented in **Chapter 2: The Decommissioning Process.**

9.1.3. This chapter is supported by the following figures provided in Volume II of this ES:

- Figure 9.1: Designated Sites.

9.1.4. This chapter is supported by the following appendices provided in Volume III of this ES:

- Appendix 9A: Hinkley Point B Intertidal Survey Report; and
- Appendix 9B: Hinkley Point B Subtidal Survey Report.

9.1.5. Marine biodiversity is defined as being the biodiversity of the ecosystems found below high tide (generally taken as mean high water spring, MHWS) therefore coastal vegetation other than kelp and seagrass (considered within intertidal habitats in this chapter) is discussed in **Chapter 8: Terrestrial Biodiversity and Ornithology**. Seabirds and shorebirds have been considered alongside other ornithological receptors and are also covered in **Chapter 8: Terrestrial Biodiversity and Ornithology**.

9.1.6. **Chapter 10: Coastal Management and Water Quality**, discusses abiotic processes relevant to habitats and the species they support.

9.1.7. This chapter assesses the likelihood of changes to the abundance and distribution of species and/or habitats resulting from the dismantling and decommissioning of the existing marine structures.

9.2 Relevant legislation, policy and technical guidance

Legislation

9.2.1. Historically, much of the protection afforded to marine habitats and species in the UK has been through European Union (EU) directives as transposed into national legislation. On 31 December 2020, the UK exited the EU following the expiry of the "transition period", as provided for by the European Union (Withdrawal) Act 2018 (Withdrawal Act 2018)[1]. Sections 2-3 of the Withdrawal Act 2018, as amended, state that direct EU legislation, and EU-derived domestic legislation, continue to have effect in UK domestic law after that date. In summary, the interpretation of any retained EU law is to be the same as it was before that date, insofar as the retained EU law remains unmodified in

[1] UK Government (2018). European Withdrawal Act 2018. (Online). Available at: www.legislation.gov.uk/ukpga/2018/16/contents/enacted (Accessed: August 2024).

UK law and regulations have not been made providing otherwise (s. 6(3) of the Withdrawal Act 2018).

9.2.2. The legislation presented in **Table 9-1** is relevant to the assessment of the effects on marine biodiversity receptors.

Table 9-1 - Legislation relevant to marine biodiversity

Legislation	Relevance
Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive)[2] (as amended)	Adopted in 1992, the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, aims to promote the maintenance of biodiversity, taking account of economic, social, cultural and regional requirements. With the Birds Directive, it forms the cornerstone of Europe's nature conservation policy and establishes the EU wide Natura 2000 ecological network of protected areas, safeguarded against potentially damaging developments. It also lists species of conservation concern and is thus relevant to defining the importance of potential receptors. Within the Habitats Directive, Annex I outlines the specific habitats designated for protection within Special Areas of Conservation (SACs), with Annex II detailing species protected within SACs.
The Conservation of Habitats and Species Regulations 2017 (as amended[3]) (Habitats Regulations)[4]	The Habitats Directive is translated into UK law. The Habitats Regulations cover the requirements for: • protecting sites that are internationally important for threatened habitats and species – i.e. European sites; and • a legal framework for species requiring strict protection – i.e. European protected species
Council Directive 2008/56/EC Establishing a Framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive)[5]	The EU adopted the Marine Strategy Framework Directive (MSFD) in July 2008. It requires Member States to take measures to achieve or maintain Good Environmental Status (GES) by introducing measures, to be monitored against defined indicators of GES. Since the UK left the EU, the UK government has made changes to the Marine Strategy Regulations 2010 which transpose the requirements of the EU's Marine Strategy Framework Directive into domestic law (see below), so that they continue to be effective now that the UK is no longer part of the EU. The existing UK-wide framework has been maintained to allow for consistent marine environmental monitoring and standards across the UK. The UK continues to develop its marine strategy with other countries in the north-east Atlantic, through the OSPAR Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic) following exit from the EU. GES therefore remains relevant across the whole of the UK including the devolved administrations.

[2] Defra (2021). Changes to the Habitats Regulations 2017. (Online). Available at: https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017 (Accessed: August 2024).

[3] Including amendments made by The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

4 UK Government (2017). The Conservation of Habitats and Species Regulations 2017 as amended. (Online). Available at: http://www.legislation.gov.uk/uksi/2017/1012/contents (Accessed: August 2024).

[5] European Commission (2008). Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive). (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32008L0056 (Accessed: August 2024)

Legislation	Relevance
Marine Strategy Regulations 2010[6]	The UK's Marine Strategy Regulations transpose the MSFD into UK law for the entire UK and are to be read as if the UK were a Member State. The relevance to the decommissioning activities at HPB is that this legislation implements the requirements and metrics associated with achieving GES in England. The existing UK-wide framework has been maintained to allow for consistent marine environmental monitoring and standards across the UK. The UK continues to develop its marine strategy with other countries in the north-east Atlantic, through the OSPAR Convention (Convention for the Protection of the Marine Environment of the North-East Atlantic)[7] following exit from the EU (as described above). GES therefore remains relevant across the whole of the UK including the devolved administrations.
The Wildlife and Countryside Act 1981[8]	The 1981 Act applies to inshore waters (within 12 nautical miles (nm) of land). Part 1 of the Act details wildlife-based offences relating to actions taken against the wild animals listed in Schedule 5. From a marine perspective, key species listed on Schedule 5 of the Act include some migratory and non-migratory fish species; cetaceans; and sea turtles.
The Marine Works (Environmental Impact Assessment) Regulations (MWR) 2007 (as amended)	The MWR require that certain types of applications with the potential to result in significant effects on the environment are supported by an EIA, before a Marine Licence decision is made.
Environmental Impact Assessment (EIA) Directive (2011/92/EU)[9] (as amended by EIA Directive 2014/52/EU)[10]	The Environmental Impact Assessment (EIA) Directive aims to ensure that projects that are likely to have a significant impact on the environment are identified and assessed within an appraisal process.

[6] UK Government (2010). The Marine Strategy Regulations 2010. (Online). Available at: https://www.legislation.gov.uk/uksi/2010/1627/contents/made (Accessed: August 2024).
[7] OSPAR Commission (1992). Convention for the Protection of the Marine Environment of the North-East Atlantic. (Online). Available at: https://www.ospar.org/site/assets/files/1169/ospar_convention.pdf (Accessed: August 2024)
[8] UK Government (1981). Wildlife and Countryside Act 1981. (Online) Available at: http://www.legislation.gov.uk/ukpga/1981/69 (Accessed: August 2024)
[9] European Commission (2011). Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment. (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32011L0092&from=EN (Accessed: August 2024).
[10] European Commission (2014). Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment. (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052&from=EN (Accessed January 2024).

Legislation	Relevance
The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[11] (WFD Regulations)	The Water Framework Directive (WFD) originates from the EU but has been retained in UK law following the UK's exit from the EU in the form of the WFD regulations. At its core it aims to prevent deterioration of the water environment and improve water quality by managing water in natural river basin districts, rather than by administrative boundaries. It addresses ecological, physico-chemical, quantitative and morphological aspects of the water environment and requires that improvements take account of economic aspects, including costs and benefits. Plans to improve the status of water bodies are set out in River Basin Management Plans (RBMPs). HPB is situated within the jurisdiction of the South West River Basin District RBMP; details on the water quality within this area are provided and discussed within **Chapter 10: Coastal Management and Water Quality** and **Chapter 11: Surface Water and Flood Risk**.
The Marine and Coastal Access Act 2009[12]	This Act defines arrangements for a system of marine management, including the introduction of marine planning across the UK. The new arrangements provided for the creation of the Marine Management Organisation (MMO). The MMO delivers UK marine policy objectives for English water through a series of statutory Marine Plans and other measures. Changes were made to the management of marine, migratory and freshwater fisheries, marine conservation, as well as recreational access to the English and Welsh coasts. The Proposed Works that are likely to require a Marine Licence include the removal of the intake structures on top of the seabed in the Severn Estuary and the potential for the installation of a new Active Effluent Discharge Line (AEDL) and sewage treatment plant (STP) discharge line, via the existing outfall tunnel. An application for a Marine Licence may require supporting information under the WFD Regulations[13], Conservation of Habitats and Species Regulations 2017[14] and the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended)[15].
The Conservation of Offshore Marine Habitats and Species Regulations 2017[16]	The 'Offshore Marine Conservation' Regulations implement the species protection requirements of the Habitats and Birds Directives offshore (i.e. more than 12 nautical miles (nm) from shore). They apply to the offshore marine area, offshore marine installations, and certain ships and crafts. Whilst the Proposed Works occur within 12 nm of the shore, meaning the Regulations will not directly apply, they have been listed here for completeness, as well as for consideration of whether any potential effects may extend into the offshore zone.

[11] UK Government (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. Available online at http://www.legislation.gov.uk/uksi/2017/407 (Accessed: August 2024).
[12] UK Government (2009). Marine and Coastal Access Act 2009. (Online). Available at: https://www.legislation.gov.uk/ukpga/2009/23/contents (Accessed: August 2024).
[13] UK Government (2017). The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. (Online). Available at: https://www.legislation.gov.uk/uksi/2017/407/contents/made (Accessed: August 2024).
[14] UK Government (2017). The Conservation of Habitats and Species Regulations 2017. (Online). Available at: http://www.legislation.gov.uk/uksi/2017/1012/contents/made (Accessed: August 2024).
[15] UK Government (2007). The Marine Works (Environmental Impact Assessment) Regulations 2007. (Online). Available at: https://www.legislation.gov.uk/uksi/2007/1518/contents/made (Accessed: August 2024).
[16] UK Government (2017). The Conservation of Offshore Marine Habitats and Species Regulations 2017. (Online). Available at: https://www.legislation.gov.uk/uksi/2017/1013/contents/made (Accessed: August 2024).

9.3 Policy

A summary of the relevant policies is presented in **Table 9-2.**

Table 9-2 - Policy relevant to marine biodiversity

Policy reference	Policy relevance
National Policies	
National Planning Policy Framework (NPPF) (2023)[18]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works. Paragraph 185 of the NPPF discusses how plans should protect and enhance habitats and biodiversity (including the marine environment). The policy aims to promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity. Paragraph 186 goes on to state, significant harm to biodiversity resulting from the Proposed Works should be avoided, adequately mitigated, or, as a last resort, compensated for.
National Planning Policy for Waste (NPPfW) (2014)[17]	The National Planning Policy for Waste (NPPfW) sets out detailed waste planning policies. It should be read in conjunction with the National Planning Policy Framework (NPPF)[18], and the WMPE (and National Policy Statements, where relevant). All Local Planning Authorities (LPAs) should have regard to its policies when discharging their responsibilities to the extent that they are appropriate to waste management, and how potential impacts on the environment (including marine) can be reduced / avoided. No specific reference is made to radioactive or high activity waste in the NPPfW; however, policies are provided to guide planning and decision making in relation to waste management facilities.

[17] Department for Communities and Local Government (2014). The National Planning Policy for Waste (NPPfW) 2014. (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/364759/141015_National_Planning_Policy_for_Waste.pdf (Accessed: August 2024).

[18] Department for Levelling Up, Housing and Communities. (2023). The National Planning Policy Framework (NPPF). (Online). Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 (Accessed: August 2024).

Policy reference	Policy relevance
Waste Management Plan for England (WMPE) (2021)[19]	The WMPE, which is regularly revised, provides an analysis of the current waste management situation in England and identifies the requirement for future measures. The Plan is designed to bring together current plans and policies already in place and aims to achieve positive effects in respect of biodiversity, land use, geology and soils and on climatic factors.
UK Marine Policy Statement (2011)[20]	The UK Marine Policy Statement (MPS) is the framework for preparing local Marine Plans (see below), and taking decisions which affect the marine environment. The MPS was prepared to support the Marine and Coastal Access Act 2009 (see above for further details), to ensure that marine resources in the UK are used in a sustainable way, and in line with high-level objectives for the marine environment, namely: ▪ sustainable economic development; ▪ supporting the UK's move towards a low-carbon economy, mitigating the causes of carbon change; ▪ a sustainable marine environment with healthy and functioning marine ecosystems, protecting the marine habitats and species; and ▪ contributing to societal benefits of the marine area.
Local Policies	
South West Inshore and South West Offshore Marine Plan (2021)[21]	This plan was prepared as a result of Section 51 of the Marine and Coastal Access Act 2009, and in line with the UK MPS (see above), covering the South West region, including the area of the Proposed Works. It provides a "*strategic approach to planning within the English inshore and offshore waters between the Severn Estuary border with Wales and the River Dart in Devon*". Its purpose being to "*enhance and protect the marine environment and achieve sustainable economic growth while respecting local communities both within and adjacent to the marine plan areas*". The specific policy "SW-FISH-3" encourages and supports proposals that deliver biodiversity gain for essential fish habitats. Policy "SW-BIO-1" is aimed at biodiversity. Maintaining the distribution of priority habitats and priority species in the south west marine plan areas is important as it reduces habitat fragmentation, species isolation and

[19] UK Government (2021). National Waste Management Plan. (Online). Available at: Waste Management Plan for England (publishing.service.gov.uk) (Accessed: August 2024)
[20] UK Government (2011). UK Marine Policy Statement. (Online) Available at: https://www.gov.uk/government/publications/uk-marine-policy-statement. (Accessed August 2024).
[21] South West Inshore and South West Offshore Marine Plan (2021). (Online). Available at: South West Inshore and South West Offshore Marine Plan (publishing.service.gov.uk) (Accessed: August 2024).

Policy reference	Policy relevance
	supports strong, biodiverse communities which in turn provide ecosystem services. SW-BIO-1 encourages and supports proposals that enhance the distribution of priority habitats and priority species. SW-BIO-1 seeks to maintain the distribution of priority habitats and priority species through the management of significant adverse impacts. Proposals that cannot avoid, minimise and mitigate or, as a last resort, compensate for significant adverse impacts, will not be supported.
Somerset Waste Core Strategy (2028)[22]	The Waste Core Strategy Development Plan guides the County Council's approach to planning for sustainable waste management in Somerset until the year 2028. The Strategy covers the whole of Somerset, including the area of the Proposed Works. It seeks to implement a strategy that protects inter alia the county's environmental features in the context of economic development.
Adopted West Somerset Local Plan to 2032 (2016)[23]	The West Somerset Local Plan was adopted in November 2016. The document includes a set of planning policies for the parts of the area outside Exmoor National Park. It replaces most of the policies of the Saved West Somerset District Local Plan adopted in 2006. Coastal change management areas are defined within the plan which also identifies "*significant areas protected as Natura 2000 sites under the 1992 European Community Habitats Directive23 for their ecological value as well as nationally designated Sites of Special Scientific Interest*".
North Devon and Somerset Shoreline Management Plan (SMP2) (2010)[24]	The SMP is a large-scale assessment of the risks associated with coastal tides and aims to help inform the future management of these risks to land (and by extension, biodiversity features) and people through its action plan. Particular aspects of relevance to the Proposed Works, which sit within the area of the SMP, are: ▪ Hinkley Point (Unit 7d31): Long-term plan to continue to provide protection against flood and erosion risk. ▪ To 'hold the line' at Hinkley Point, in short-term, medium-term and longer-term periods.

[22] Somerset County Council (2013). Somerset Waste Core Strategy. (Online). Available at somersetcc.sharepoint.com/sites/SCCPublic/Waste/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FWaste%2FSomerset Waste Core Strategy%2Epdf&parent=%2Fsites%2FSCCPublic%2FWaste&p=true&ga=1 Accessed January 2024).
[23] West Somerset Council (2016). West Somerset Local Plan to 2032. (Online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 Accessed January 2024).
[24] North Devon and Somerset Coastal Advisory Group (2010) Shoreline Management Plan Review (SMP2) Hartland Point to Anchor Head. (Online). Available at: Microsoft Word - Main SMP Doc - FINAL v10 MASTER VERSION .doc (data.gov.uk) (Accessed January 2024).

Policy reference	Policy relevance
	▪ Maintenance of existing defences. ▪ Potential for coastal squeeze at Hinkley Point (sea level rise against sea defences) in short, medium and longer-term, resulting in a net decrease of intertidal habitat.

Technical guidance

9.3.1. Technical guidance that is relevant to the assessment of the effects on marine biodiversity receptors is presented in **Table 9-3.**

Table 9-3 - Technical guidance relevant to marine biodiversity

Technical guidance	Context
Guidelines for Ecological Impact Assessment in the UK and Ireland; Terrestrial, Freshwater, Coastal and Marine version 1.1[25]	Good practice guidance on Ecological Impact Assessment (EcIA).
NE Atlantic Marine Biological Analytical Quality Control (NMBAQC) Scheme[26]	Provides a source of external Quality Assurance (QA) for marine biological data and details good practice guidance for the collection of PSA samples to support biological analysis.
Guidelines for Baseline Ecological Assessment[27]	Guidance on baseline ecological assessment.
Guidelines for Preliminary Ecological Appraisal, 2nd edition[28]	Good practice guidance on preliminary ecological appraisal.
Handbook for Phase 1 Habitat Survey - a technique for environmental audit[29]	Good practice guidance on Phase 1 Habitat surveys (including intertidal surveys).
Guidance on Assigning Benthic Biotopes using EUNIS or the Marine Habitat Classification of Britain and Ireland (revised 2019)[30]	Guidance on how to apply benthic biotope classifications to survey data.

[25] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management; Winchester, UK. (Online). Available at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1Update.pdf (Accessed: August 2024).
[26] NMBAQC's Best Practice Guidance: Particle Size Analysis (PSA) for Supporting Biological Analysis (2022). (Online). Available at: https://www.nmbaqcs.org/media/ibzlxdej/psa-guidance_update2022.pdf (Accessed: August 2024).
[27] Institute of Environmental Assessment. (1995). Guidelines for Baseline Ecological Assessment. E & FN Spon; London, UK.
[28] Chartered Institute of Ecology and Environmental Management. (2017). Guidelines for Preliminary Ecological Appraisal, 2nd edition. CIEEM; Winchester, UK.
[29] Joint Nature Conservation Committee. (2010). Handbook for Phase 1 Habitat Survey - a technique for environmental audit. JNCC; Peterborough, UK.
[30] Parry, M.E.V. (2019) Guidance on Assigning Benthic Biotopes using EUNIS or the Marine Habitat Classification of Britain and Ireland (revised 2019), JNCC Report No. 546, JNCC, Peterborough, ISSN 0963-8091.

Technical guidance	Context
JNCC Marine Monitoring Handbook procedural guidance 1.1 and 3.6[31]	Guidance for best practice survey techniques for marine species and habitats.

9.4 Data gathering methodology

Study Area

9.4.1. Study Areas were determined based on good practice guidance (see **Table 9-3**), the types of ecological features known to be present, and the likely effects that could occur. The Study Areas were defined on a precautionary basis to ensure that, as a minimum, the Zone of Influence (ZoI), defined as the area around the Works Area that may be affected by the proposed activities, is covered during baseline data collection.

9.4.2. The marine ecological features have been scoped in based on their occurrence within the Works Area and immediate environs, and based on their conservation status, foraging ranges/distribution, and legislative protection in the proximity of the Proposed Works and as determined from desk review and field surveys.

9.4.3. For each species group the Study Areas have been determined based on their mobility and likely extent of impacts resulting from the Proposed Works. Therefore, for pinniped species, Study Areas have been based on established foraging ranges, using distances of 120 km for common seal, and 145 km for grey seal[32]. Natal fish waters have been considered within 200 km of the Works Area, and where there is potential for connectivity between the Works Area and the natal waters to arise[33]. For cetacean species, a distance of 200 km has been applied.

9.4.4. The Study Areas for habitats / benthic communities comprise the intertidal and benthic zones within the Works Area (see **Figure 1.1** for the extent of the Works Area) and the ZoI of the Proposed Works (see **Figure 9.1**). It should be noted that Study Areas extend further than the Works Area (see **Table 9-4** for further details associated with each receptor group).

[31] Davies, J., Baxter, J., Bradley, M., Connor, D., Khan, J., Murray, E., Sanderson, W., Turnbull, C. and Vincent, M. (2001). Joint Nature Conservation Committee Marine Monitoring Handbook, 405 pp, ISBN 185716 550 0.
[32] Sea Mammal Research Unit (SMRU) (2011) - Special Committee on Seals (SCOS) Scientific advice on matters related to the management of seal populations: 2011. (Online). Available at: http://www.smru.st-andrews.ac.uk/files/2016/08/SCOS-2011.pdf (Accessed: August 2024).
33 MMO (2020) MMO1188: Habitats Regulations Assessment for the North East, North West, South East and South West Marine Plans: Screening Report and Appropriate Assessment Information Report. (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/857273/AAIR_final.pdf (Accessed: August 2024).

Table 9-4 - Extent of Study Areas for each receptor group

Receptor group	Extent from the Works Area boundary
Intertidal habitats/species	20 km
Subtidal habitats/species	20 km
Fish (migratory and non-migratory)	200 km
Cetaceans	200 km
Pinnipeds	120 km for common seal and 145 km for grey seal

9.4.5. The temporal scope of the assessment for marine biodiversity is consistent with the period over which the Proposed Works would be carried out and therefore covers all three decommissioning phases (see **Chapter 2: The Decommissioning Process**).

Desk study

9.4.6. Desk studies have been undertaken as a preliminary stage to identify key features of the environment in proximity to the Proposed Works and to identify any designated sites that could potentially be affected within the relevant Study Areas (described in).

9.4.7. The assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by the following principal data sources:

- the ES that accompanied the Development Consent Order (DCO) Application for the Hinkley Point C (HPC) development (2011), and subsequent non-material changes, as appropriate[34];
- the ES that accompanied the Marine Licence application for the HPC development, and subsequent variations, from 2013 to 2022[35];
- NBN Atlas Wales[36];
- JNCC Marine Recorder[37];
- Defra Magic Map Application[38]; and
- Sea Watch Foundation sightings of marine mammals[39].

Survey work

9.4.8. Site-specific baseline surveys were undertaken in September 2020 for the intertidal zone, and in November 2021 for the subtidal benthic environment. Quarterly water quality sampling was also completed between 2020 and 2022. An additional validation survey of the intertidal zone was also undertaken in October 2022 to ensure that the scope of the survey completed in September 2020 remained adequate to inform the EIA.

[34] EDF Energy (2011). Environmental Statement – Volume 2 Hinkley Point C Development Site. (Online). Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20190919184551mp_/https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010001/EN010001-005038-4.3%20-%20Volume%202%20-%20Hinkley%20Point%20C%20Development%20Site%201.pdf (Accessed January 2024).
[35] Marine Licence L/2013/00178/8.
[36] NBN Atlas Wales. (Online), Available at: https://wales.nbnatlas.org/. (Accessed: August 2024).
[37] JNCC Marine Recorder. (Online). Available at: https://jncc.gov.uk/our-work/marine-recorder/. (Accessed: August 2024).
[38] Defra Magic Map Application. (Online). Available at: https://magic.defra.gov.uk/magicmap.aspx (Accessed: August 2024).
[39] Sea Watch Foundation (2021). (Online). Available at: NWDW-2021-Report_FINAL-2.pdf (seawatchfoundation.org.uk) (Accessed: August 2024).

9.4.9. As outlined within **Section 9.1**, the survey reports from the intertidal validation survey and subtidal survey are presented as **Appendices 9A and 9B**. The habitat maps generated from this work are discussed in more detail below.

Data limitations

9.4.10. The following limitations to the baseline data are acknowledged:

- Marine mammal data is based on citizen science inputs and literature review rather than dedicated site-specific survey. However, given the location and limited extent of the Proposed Works, the data used are considered adequate for the purposes of this assessment.
- No data on sediment quality around the location of the proposed works are available to assess potential contamination, and secondary implications to biodiversity. The limited scope for sediment remobilisation and secondary impacts to biota associated with the Proposed Works, however, means that this does not materially affect the conclusions of this assessment.
- No site-specific fish surveys were undertaken, and only limited information is available on the non-commercial fish species in the Severn Estuary and inner Bristol Channel. The limited spatial extent of potential impacts means that this does not materially affect the conclusions of this assessment.
- The interpretation of data collected for the *Sabellaria* reef assessment is reliant on expert interpretation and judgement.

9.5 Consultation

Overview

9.5.1. The assessment has been informed by consultation responses and statutory and stakeholder engagement.

Pre-application opinion

9.5.2. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the assessment of effects on marine biodiversity and confirmation of how these are addressed by the assessment is included in **Table 9-5**.

Table 9-5 - Summary of Pre-application opinion responses

Paragraph ref.	Consideration	Addressed within the Environmental Statement (ES)
Appendix 2, Table row 3	In **Chapter 8: Marine Biodiversity** of the Scoping Report, relevant SACs, SPAs and Ramsar sites have not been identified in the Study Area and no justification for this is given. In addition to this, the River Usk, River Twyi, Carmarthen Bay & Estuaries, Cleddau Rivers and Pembrokeshire Marine SACs are omitted from the discussion of designated sites and it is not clear if they are within the Study Area.	It is not the role of the EIA to assess impacts on European Sites; this is covered within the HRA Screening Report. Where potential impacts to any SACs, SPAs or Ramsar sites are identified, these are fully assessed within the HRA process. Designated sites and their relationship with the applicable Study Area are shown in **Figure 10.1**. Nonetheless, the ecology of the relevant features within designated sites has been

Paragraph ref.	Consideration	Addressed within the Environmental Statement (ES)
		considered within **Section 9.10** of this assessment.
Appendix 2, Table row 5	In **Chapter 8: Marine Biodiversity** of the Scoping Report paragraph 8.5.10 refers to the importance of ecological features and how this will be categorised. The text suggests that only 'important' ecological features will be considered for potential significant effect. Receptors cannot be ruled out of the assessment based on their 'importance'. All marine receptors potentially affected by the project (regardless of their 'importance') must be included for assessment. In addition, it is not clear how the geographic context of the importance is being used for the assessment, or how the 'importance' is considered in terms of significance of effects or receptor sensitivity.	This is noted. The importance of marine ecological receptors is based on a number of factors including conservation status and ecological relationships. Importance itself is not used to screen out receptors from potential effects, but merely to allow a consistent definition of impact significance. Therefore, all receptors, whether they are of negligible or high importance, are considered.
Appendix 2, Table row 8	In Table 8.7, the cessation of operation of the cooling water system has been considered, clarity should be provided on when this activity will take place i.e. is it part of defueling or part of the decommissioning project?	Cessation of the cooling water system is scheduled to take place during the Preparation for Quiescence phase, prior to the installation of the AEDL and STP discharge line.
Appendix 2, Table row 9	In **Chapter 8: Marine Biodiversity** of the Scoping Report there is an absence of what activities occur in the marine environment that also form part of the baseline, e.g. commercial fishing, shipping, dredging. This should be considered in the EIA. In addition, the Scoping Report does not set out an existing baseline of potential noise sources in the marine environment, so the requirement of baseline noise surveys and type cannot be determined if acceptable.	The scale of activities associated with the Proposed Works does not impinge on any extant commercial fishing, shipping or dredging. Additional information on these topics is presented within **Appendix 5B**.
Appendix 2, Table row 10	In **Chapter 8: Marine Biodiversity** of the Scoping Report the proposed scope in Table 8.8 seems to be high level; the receptors that could be significantly affected are grouped as 'marine habitats and species'. A list of potential marine ecological receptors that could be affected are set out in Table 8.7 but it is unclear which receptors could be significantly affected and thus to be taken forward for further assessment.	Noted. All relevant marine ecological receptors have been assessed in **Section 9.10** including intertidal habitats and benthos, subtidal habitats and benthos, fish, and marine mammals.
39 (cont.)	Limited information on the potential environmental impacts of the decommissioning of marine infrastructure: the demolition of the intake structure to seabed level and the breaking up of the outfall structure at the head of the outfall channel (as detailed in **Section 2** of the scoping report)	Additional detail when compared against the Scoping Report, is presented within this assessment, with respect to the works planned within the marine environment (see **Chapter 2: The Decommissioning Process**).

Paragraph ref.	Consideration	Addressed within the Environmental Statement (ES)
	may cause adverse effects on marine receptors. In addition to this, further information on the timing of this work is required in order to assess the potential cumulative effects with other marine activities and in-combination impacts in the Habitats Regulations Assessment.	Specific responses to points applicable to marine biodiversity are presented in this chapter. Notably, that the outfall structure will be left in-situ for the duration of the Proposed Works, rather than being demolished.
42	Through the iterative EIA process, further scoping should be undertaken on those receptors/ effects that have not been considered sufficiently as more information becomes available and any changes to the scope should be substantiated in the ES. The following areas should be considered: Impacts to the marine environment that may have an indirect effect to birds. Impacts to noise sensitive receptors	Potential effects from the Proposed Works on birds are presented in **Chapter 8: Terrestrial Biodiversity and Ornithology.** Potential effects from the Proposed Works on marine ecological noise sensitive receptors are presented in **Section 9.11**.
54	There are a number of potential omissions in the Legislation, Policy and Guidance section of the scoping report (Chapter 3), for example, Conservation of Offshore Marine Habitats and Species Regulations 2017 and relevant policies in the Local Plan. A full review and consideration of relevant legislation, policy and guidance applicable to the EIA should be documented in the ES, including an explanation of why they are relevant and how they have been considered in the EIA	Additional legislation, policy and guidance has been presented in **Section 9.2**.

Non-statutory consultation

9.5.3. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

9.5.4. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

9.5.5. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. No comments relevant to the marine biodiversity assessment were received.

Technical engagement

9.5.6. **Table 9-6** summarises the technical engagement that has been undertaken in relation to the marine biodiversity assessment.

Table 9-6 Technical engagement undertaken in relation to the marine biodiversity assessment

Stakeholder	Meeting date	Points discussed
Somerset Council	12 June 2024	Overview of the relevant baseline conditions, the assessment's findings and embedded environmental measures.
Environment Agency	11 July 2024	Overview of the relevant baseline conditions, the assessment's findings and embedded environmental measures.
Natural England	18 July 2024	Overview of the relevant baseline conditions, the assessment's findings and embedded environmental measures.

9.6 Baseline

Current baseline

9.6.1. This section sets out the baseline environmental characteristics of the Works Area and surrounding areas with respect to marine biodiversity.

The Site and its surrounds

9.6.2. The HPB Site is located on the north coast of Somerset on the shores of the Bristol Channel[40]. It is approximately 12 km north-west of the town of Bridgwater. The smaller settlements of Wick, Burton, Shurton, Stogursey and Stolford are all within 3 km of the Site.

9.6.3. The main features surrounding the Site and its immediate foreshore are mudflats to the north and east. The intertidal mudflats of Bridgwater Bay are separated from the Site by a low cliff, of around 5-10 m in height. At low tide the shore adjacent to the Site comprises a narrow rock platform, interspersed with and fringed by mudflats; while to the east, the mudflats extend up to 500 m from the shoreline at low water.

[40] The cutoff between the Severn Estuary and the Bristol Channel on the English bank has been set by the International Hydrographic Organisation as Sand Point, near Weston Super Mare.

9.6.4. Within the marine environment (intertidal and subtidal), the Site comprises components of the cooling water system, i.e. the outfall and intake infrastructure that forms part of the Proposed Works. Hence, the Works Area includes these areas, which are considered within this assessment.

9.6.5. From an anthropological perspective, construction of HPC is ongoing adjacent to the Works Area. Whilst the intake and outfall heads for HPC have been installed, the fish recovery and return (FRR) system is still to be installed. This is considered further within **Section 9.13**.

Designated sites

9.6.6. The Works Area is situated within the Bridgwater Bay Site of Special Scientific Interest (SSSI).

9.6.7. The Works Area is also partially within the Severn Estuary SPA, SAC and Ramsar site (to the north, east and south of HPB) and close to the Somerset levels and Moors SPA / Ramsar site (approximately 16 km to the east).

9.6.8. The Severn Estuary SAC contains three Annex I habitats listed as primary reasons for site selection:

- estuaries;
- mudflats and sandflats not covered by seawater at low tide; and
- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*).

9.6.9. Other habitats present, but not a primary reason for site selection are:

- sandbanks, which are slightly covered by seawater all the time; and
- reefs.

9.6.10. Three Annex II fish species are also present, and a primary reason for site selection. These are sea lamprey (*Petromyzon marinus*), river lamprey (*Lampetra fluviatilis*) and twaite shad (*Alosa fallax*).

9.6.11. The Severn Estuary SAC comprises 99% tidal rivers, estuaries, mudflats, sandflats and lagoons, with the remaining 1% made up of saltmarshes, salt pastures and salt steppes[41].

9.6.12. The River Wye SAC, located approximately 90 km from the Works Area, is designated to protect sea lamprey, brook lamprey (*Lampetra planeri*), river lamprey, twaite shad, Atlantic salmon (*Salmo salar*), bullhead (*Cottus gobio*), otter (*Lutra lutra*) and allis shad (*Alosa alosa*). Sea lamprey, river lamprey, twaite shad and salmon navigate through the Severn Estuary to and from the River Wye SAC.

9.6.13. Other designated sites in the vicinity of HPB include:

- Blue Anchor to Lilstock Coast SSSI (approximately 1 km);
- Steep Holm SSSI (approximately 14 km);
- Brean Down SSSI (approximately 14 km);
- Flat Holm SSSI (approximately 18 km);
- River Usk / Afon Wsyg SAC and SSSI (approximately 40 km);
- Afon Tywi/ River Tywi SAC (approximately 107 km by land);
- Bristol Channel Approaches (approximately 90 km by land);
- Carmarthen Bay and Estuaries/ Bae Caerfyrddin ac Aberoedd SAC (approximately 79 km by land);

[41] JNCC Special Area of Conservation: Severn Estuary / Môr Hafren. (Online). Available at: https://sac.jncc.gov.uk/site/UK0013030 (Accessed: August 2024).

- Afonydd Cleddau / Cleddau Rivers SAC (approximately 142 km by land);
- Lundy SAC (approximately 105km by land)and
- Pembrokeshire Marine / Sir Benfro Forol SAC (approximately 121 km by land).

Intertidal ecology

9.6.14. A total of twelve biotopes (eight hard substrate and four sedimentary) were recorded during an intertidal validation survey of the foreshore adjacent to HPB on 26 and 27 October 2022 (the final report of this survey is present as **Appendix 9A**).

9.6.15. Only littoral biotopes selected from the JNCC Marine Habitat Classification System[42] were recorded, as subtidal biotopes could not be confirmed from a walkover survey. A summary of the biotopes recorded is presented in **Table 9.5** Biotopes recorded ranged from those typical of a more sheltered environment in the upper shore with a transition to biotopes typical of exposed environments further out in the Severn Estuary.

9.6.16. There is no evidence of significant change in the upper shores of the survey area since the 2020 Phase 1 habitat survey. The tidal state was lower during the 2022 habitat validation survey therefore a greater intertidal area was accessible. This allowed access to the lower shore and a greater exposure of the limestone layers. Due to this there was a greater representation of the biotopes **LS.LBR.Sab.Salv** and **LR.Rkp.Cor.Cor** compared to the 2020 Phase 1 habitat survey.

9.6.17. Further up the shore there was barren shingle (**LS.LCS.Sh.BarSh**), which extended further down the shore compared to the 2020 survey.

9.6.18. No JNCC Marine Protected Areas (MPA), protected species or other notable fauna or flora were recorded during the habitat validation survey. *Sabellaria alveolata* was recorded following both the 2020 and 2022 surveys. Although this species is not protected under UK legislation, they can form extensive biogenic reefs that support ecosystems by stabilising the sedimentary environment; providing hard substrate for other sessile organisms to colonise and afford diverse habitat types for a range of organisms. The reef structures are classed as Annex I biogenic habitats under the 'Reefs' feature of the EC Habitats Directive and are listed within the UK Biodiversity Action Plan.

9.6.19. The Severn Estuary is one of the few places where *S.alveolata* reefs occur extensively in both the subtidal and intertidal zones[43]. Although the reefs at this location are outside the boundary of the SSSI, they are a qualifying feature in the European Site Objectives for the Severn Estuary/Mor Hafren Special Area of Conservation[44].

9.6.20. Littoral mud was identified landward of the intertidal *Sabellaria* reef. The area immediately offshore of the subtidal *Sabellaria* reef was classified as sublittoral sands and muddy sands. The majority of the survey area to the north was identified as sublittoral mud and sandy mud.

9.6.21. Another notable feature of this shore is the intertidal assemblages of *Corallina*; a calcareous seaweed species of national importance. *Corallina* species provide habitat for numerous

[42] JNCC (2022) The Marine Habitat Classification for Britain and Ireland Version 22.04. (Online). Available at https://mhc.jncc.gov.uk/ (Accessed: August 2024).
[43] Severn Estuary Ramsar Site: Regulation 33 Advice from CCW and Natural England, June 2009. (Online). Available at: Severn Estuary EMS (naturalengland.org.uk) Accessed: August 2024).
[44] European Site Conservation Objectives for Severn Estuary SAC (UK0013030) (2014). (Online). Available at: https://publications.naturalengland.org.uk/publication/6081105098702848 (Accessed: August 2024).

invertebrate species that require shelter along exposed shorelines. Coralline algae are useful indicators of climate change[45].

Table 9-7 - Summary of intertidal biotopes recorded during the 2022 survey.

Biotope code	Biotope name	Species recorded
Hard Substrate Biotopes		
LR.LLR.FVS.AscVS	*Ascophyllum nodosum* and *Fucus vesiculosus* on variable salinity mid eulittoral rock	*Fucus* spp. *Ascophyllum nodosum* Ulvaceae
LR. FLR.Eph.EphX	Ephemeral green and red seaweeds on variable salinity and/or disturbed eulittoral mixed substrate	
LR.FLR.Rkp.Cor.Cor	Coralline crusts and *Corallina officinalis* in shallow eulittoral rockpools	*Corallina officinalis* *Ulva* spp. *Littorina littorea* *Actinia equina*
LR.FLR.Rkp.SwSed	Seaweeds in sediment-floored eulittoral rockpools	*Ulva* spp. *Corralina officinalis*
LR.MLR.BF.Fser.Bo	*Fucus serratus* and under-boulder fauna on exposed to moderately exposed lower eulittoral boulders	*Fucus serratus* *Semibalanus balanoides* *Patella valgata*
LR.LLR.FVS.FvesVS	*Fucus vesiculosis* on variable salinity mid eulittoral boulders and stable mixed substrata	*Fucus vesiculosis* *Semibalanus balanoides*
LR.MLR.BF.FvesB	*Fucus vesiculosis* and barnacle mosaics on moderately exposed mid eulittoral rock	*Fucus vesiculosis* *Semibalanus balanoides* *Patella vulgata*
LR. HLR.MusB.Sem.Sem	*Semibalanus balanoides, Patella vulgate* and *Littorina* spp. on exposed to moderately exposed eulittoral rock	*Semibalanus balanoides* *Patella vulgata* *Actinia equina*
Sedimentary Biotopes		
LS.LCS.Sh.BarSh	Barren Littoral Shingle	n/a
LR.LSa.MuSa.MacAre	*Macoma balthica* and *Arenicola marina* in littoral muddy sand	*Macoma balthica* *Arenicola marina*
LS.LMx.Mx	Littoral mixed sediment	n/a
LS.LBR.Sab.Salv	*Sabellaria alveolata* reefs on sand-abraded eulittoral rock	*Sabellaria alveolata*

Subtidal benthic ecology

9.6.22. Subtidal benthic characterisation was undertaken between 4th and 10th November 2020 in two phases. Phase I consisted of collection of singlebeam bathymetry and sidescan sonar data. Phase II comprised collection of sediment samples for particle size analysis (PSA) and macroinvertebrate assessment. The final report of this survey is presented as **Appendix 9B**.

[45] McCoy, S.J., Kamenos, N.A. (2015). Coralline algae (Rhodophyta) in a changing world: integrating ecological, physiological, and geochemical responses to global change. Journal of Phycology. 51(1): 6-24. (Online). Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4964943/ (Accessed: August 2024).

9.6.23. Surveys covered two overlapping areas, each measuring 2 km in diameter, with one centred on the HPB cooling water intake structure and the second on the HPB cooling water discharge pipe.

9.6.24. The benthic ecology in each of the principal habitats identified was assessed through a suite of surveys including grab sampling. The dominant / characteristic species identified from each grab sample were examined in detail and used to create a biotope map of the subtidal area. In order to ensure continuity with the intertidal survey, the shallowest intertidal areas were surveyed at or around high water.

General characteristics

9.6.25. The seabed in the subtidal region of the survey area was found to predominantly consist of soft sediments. The sediment types most frequently identified were muds and sandy muds and these were distributed throughout the survey area. In addition, areas of sands and muddy sands were identified close inshore.

9.6.26. In the northwest of the survey area, an area of *Sabellaria alveolata* was identified, covering an area of approximately 50,233 m^2 (as presented in **Appendix 9B**). A larger area of *Sabellaria* was identified along the shore in the central region of the survey area, extending from the intertidal into the subtidal. In the intertidal zone this covered an area of approximately 220,105 m^2, while the subtidal sections covered an area of 206,220 m^2 (**Appendix 9B**).

9.6.27. Annex I *S.alveolata* reef structures, of varying complexity (low to high elevation) were also identified in the shallow subtidal and lower intertidal zones along approximately 1,500 m of coastline adjacent to HPB. The spatial distribution of *Sabellaria* relies on acoustic observation of coarse sediment from side scan sonar surveys carried out in 2008 and 2010 with limited ground-truth observation along with evidence obtained from intertidal observations and fragments recovered from grab and beam trawl samples at various sites in Bridgwater Bay but mostly located outside the proposed dredging area[46].

9.6.28. Macrobenthic invertebrate analysis of grab samples identified a total of 3,488 individuals and 61 taxa, dominated by annelid worms (69.9 %) and molluscs (19.9 %).

9.6.29. The most common species identified included the polychaete *S.alveolata*, which was identified in 5 of the 18 samples, the oligochaete *Tubificoides amplivasatus* and the bivalve *Limecola balthica*.

9.6.30. The microbenthic invertebrate results suggested the presence of a total of six biotopes. The majority of samples from the subtidal were found to represent one of two superficially similar biotopes; **SS.SMu.ISaMu.NhomLim** ('*Nephtys hombergii* and *Macoma balthica* in infralittoral sandy mud') and **SS.SMu.SMuVS.NhomTubi** ('*Nephtys hombergii* and *Tubificoides* spp. in variable salinity infralittoral soft mud').

9.6.31. Subtidal areas of *Sabellaria* reef were assigned to the biotope **SS.SBR.PoR.SalvMx** ('*Sabellaria alveolata* on variable salinity sublittoral mixed sediment'). In the intertidal, areas of *Sabellaria* reef were assigned the biotope **LS.LBR.Sab.Salv** ('*Sabellaria alveolata* reefs on sand-abraded eulittoral rock').

[46] BEEMS Technical Report TR039. Hinkley Point seabed habitat mapping. Interpretation of swatch bathymetry, side-scan sonar and ground-truthing results. Edition 4. Cefas, Lowestoft. (Accessed February 2024).

Habitat mapping and classification

9.6.32. The extent and distribution of habitats present within the intertidal and subtidal zones of the survey areas was mapped using acoustic surveying methods (singlebeam bathymetry and sidescan sonar), followed by a ground-truthing survey, consisting of the collection of sediment samples for particle size analysis (PSA) and macrobenthic invertebrate assessment.

9.6.33. The following EUNIS Level 3 habitats have been identified in the Study Area based on results of the acoustic data analysis, PSA and microbenthic invertebrate analysis (and presented graphically within **Appendix 9B**):

- Littoral reef Sabellaria alveolata;
- Littoral mud;
- Sublittoral reef Sabellaria alveolata;
- Sublittoral mud and sandy mud; and
- Sublittoral sands and muddy sands.

9.6.34. A 'reefiness' assessment was undertaken by Cefas, on behalf of the Applicant, in BEEMS Technical Report TR141[47] on the fragments of *Sabellaria* spp. recovered in grab samples from a 2010 survey across Bridgwater Bay[48]. Results suggest that reef development may be patchy as some samples did not show any signs of *Sabellaria.* The patchiness was due to either the sampling device which was unable to collect a representative sample from the seabed; or by naturally occurring changes to the nature of the seabed, such as transitional deposits of mud. Reefs were mainly found within EUNIS Habitat Types A5.612, confirming the EUNIS classification proposed in BEEMS Technical Report TR039[49]. Additionally, large quantities of *Sabellaria* consolidated fragments were found in beam trawl samples taken within the coarse sediment habitat associated with EUNIS Habitat Type A5.612.

9.6.35. EU guidance for interpretation of The Habitats Directive states that reefs are concretions that "arise from the seafloor". The topographic distinctness is a key mechanism through which reefs have a beneficial impact on the local environment, and tube height is used as a quantitative proxy for this. Only some of the observed *Sabellaria* spp. formations qualify as 'high' quality reef under the elevation criterion, and the additional topographic complexity offers valuable shelter and refuge for benthic communities in an otherwise flat and muddy seabed.

9.6.36. *Sabellaria* spp. were found at 19 grab sampling stations out of 38 sampled and reported in TR141. Five stations were found to have a 'Medium' reef quality score, ten stations had a 'Low' reefiness score and four stations were not considered to be *Sabellaria* reef. Other stations did not reveal any *Sabellaria* species or reef fragments.

9.6.37. No *Sabellaria* species or reef features were observed in the mud or sand dominated seabed habitats.

[47] BEEMS Technical Report TR141. Hinkley Point *Sabellaria* Assessment: Analysis of Survey Data 2010. Cefas, Lowestoft.
[48] Hendrick, V.J., & Foster-Smith, R.L. (2006). *Sabellaria spinulosa* reef: A scoring system for evaluating 'reefiness' in the context of the Habitats Directive. *Journal of the Marine Biological Association of the UK*, 86, 655-677.
[49] BEEMS Technical Report TR039. Hinkley Point seabed habitat mapping. Interpretation of swatch bathymetry, side-scan sonar and ground-truthing results. Edition 4. Cefas, Lowestoft.

Table 9-8 - Criteria for the classification of Annex 1 reef habitats

'Reefiness' criterion	Not a reef	Low	Medium	High
Elevation (cm) (Average tube height)	<2	2-5	5-10	>10
Spatial extent (m^2)	<25	23-10,000	10,000-100,000	>1,000,000
Patchiness (%occupied by tube aggregations)	<10	10-20	20-30	>30

A summary of biotopes is shown in **Table 9-9.**

Table 9-9 - Summary of biotopes recorded during the benthic survey

Biotope code	Biotope name	Species recorded
LS.LBR.Sab.Salv	*Sabellaria alveolata* reefs on sand-abraded eulittoral rock	*Sabellaria alveolata*, Collembola, Nereididae, *Pygospio elegans*; reef observed
LS.LMu.MEst.NhomLimStr	*Nephtys hombergii, Macoma balthica* and *Streblospio shrubsolii* in littoral sandy mud	High numbers of the bivalve *Macoma balthica, Nephtys hombergii*
SS.SBR.PoR.SalvMx	*Sabellaria alveolata* on variable salinity sublittoral mixed sediment	*Sabellaria alveolata*; reef observed
SS.SMu.SMuVS	Sublittoral mud and sandy mud	n/a - Particle Size Analysis (PSA) only
SS.SMu.SMuVS.Nhom.Tubi	*Nephtys hombergii* and *Tubificoides* spp. in variable salinity infralittoral soft mud	*Tubificoides amplivasatus*, *Macoma balthica*, *Nephtys* spp., *Nephtys hombergii*
SS.SMu.ISaMu.NhomLim	*Nephtys cirrosa* and *Macoma.balthica* in variable salinity infralittoral mobile sand	*Macoma balthica*, *Nephtys hombergii*, *Tubificoides amplivasatus*, *Nephtys* spp.
SS.SSa.SSaVS	Sublittoral sand in variable salinity estuaries	n/a – Particle Size Analysis (PSA) only
SS.SSa.SSaVS.NcirMLim	*Nephtys cirrosa* and *Macoma balthica* in variable salinity infralittoral mobile sand	*Macoma balthica*, *Nephtys cirrosa*

Sidescan sonar results

9.6.38. Analysis of the sidescan sonar data (as presented in **Appendix 9B**) identified several substrate types: biogenic reef and areas of sands and muds.

9.6.39. The seabed in the subtidal region of the survey area was found to predominantly consist of soft sediments. In the northwest of the survey area, a distinct region of dark acoustic return, which corresponded to the shallower depths identified in the bathymetry data, indicated the presence of a hard reef feature, likely composed of *Sabellaria* biogenic reef.

9.6.40. In the lower intertidal, banding or darker and lighter acoustic returns suggested 'rows' of biogenic reef structures interspersed with softer sediments. The shallow subtidal and lower intertidal zones either side of this biogenic reef consisted of softer sediments and corresponded with the more gradual shoaling depths observed in the bathymetry data. Acoustic data results revealed the following:

- *Sabellaria* spp. was present on rocks (7% of the stations).
- *Sabellaria* spp. rubble (13% of the stations). At the majority of stations that exhibited *Sabellaria* rubble, the footage showed a scattered rubble field with 100% coverage.
- Hummocks or reefs formed by *Sabellaria* spp. agglomerations (4% of the stations). *Sabellaria* formations show no uniform structural pattern, so the features of 'Hummock' versus 'Reef' were determined based on the area and connectivity of the structure. *Sabellaria* spp. reefs were defined by Gubbay (2007) as any area of *Sabellaria* spp. tubes elevated from the seabed (up to 30 cm) and of a large spatial extent. The key difference between reef and hummocks is that hummocks are single isolated mounds less than 1 m across, while reefs cover a much larger spatial area (> 25m^2) and may have originated from a contiguous collection of hummocks growing into each other.
- No identifiable *Sabellaria* spp. formations (76% of the 93 stations). Acoustic images showed various substrate types such as sand, sand and gravel, rocks in sand.

9.6.41. An acoustic camera is an imaging device used to locate sound sources and to characterise them. They have been useful tools for assessing biogenic structures formed by *Sabellaria* in highly turbid environments where light-based cameras may not operate effectively[50]. A total of 93 sites were observed but only 23 of those identified *Sabellaria* features. Eight of these were low elevation structures (2-5 cm), ten were medium elevation structures (5-10 cm) and five were high elevation structures (> 10 cm).

9.6.42. *Sabellaria* spp. hummocks and low formations (but not high elevation reefs) were consistently observed in these areas, supporting the correlation between a high return, "rough" acoustic texture and the possible presence of *Sabellaria* spp. Approximately 50% of ground-truth points on this texture contained *Sabellaria* spp., while the rest were barren rock or rubble.

9.6.43. High elevation, low percent coverage *Sabellaria* spp. reefs occupy a large proportion of the northern part of the study and approximately half of the proposed 2021 licensed dredging areas are also

[50] Griffin, R.A., Jones, R.E., Lough, N.E.L., Lindenbaum, C.P., Alvarex, M.C., Clark, K.A.J., Griffiths, J.D., Clabburn, P.A.T. (2020). Effectiveness of acoustic cameras as tools for assessing biogenic structures formed by *Sabellaria* in highly turbid environments. *Aquatic Conserv: Mar. Freshw. Ecosyst.:1-16*. (Online). Available at: Aquatic Conservation: Marine and Freshwater Ecosystems | Aquatic Journal | Wiley Online Library (Accessed: August 2024).

covered by potential *Sabellaria* spp. habitat (excluding previously dredged sites in 2018, which appear devoid of *Sabellaria* spp. formations).

9.6.44. Low-medium elevation features of *Sabellaria* occur at two stations inside the outfall and flotation pocket dredging footprint but no conclusive interpretation of the nature of these features can be made. *Sabellaria* spp. aggregations may develop in areas where sediment has been removed by scouring. The southern buffer for unexploded ordnance (UXO) is almost devoid of potential *Sabellaria* spp. habitat apart from a sliver in the south, which overlaps anchor sites, and a confined patch to the east. No *Sabellaria* was observed within the areas where capital dredging had previously been undertaken in 2018 for the outfall and flotation pockets.

9.6.45. Part of the observed *Sabellaria* spp. formations qualify as 'high' quality reef under the elevation criterion, and the additional topographic complexity offers valuable shelter and refuge for benthic communities in an otherwise flat and muddy seabed.

Particle size analysis

9.6.46. Five different sediment textural groups were identified: mud, slightly gravelly mud, sandy mud, muddy sand and sand with mud being the most frequently sampled sediment.

9.6.47. Proportions of gravel were very low throughout the survey area, with a maximum of 1.2 % recorded from one site.

9.6.48. Muddy sediments were distributed throughout the survey area and corresponded with areas of soft sediments identified in the sidescan sonar data. Sandier sediments were primarily located in the shallow subtidal areas surrounding the inshore area of biogenic reef. Samples taken in this area mostly comprise of muddy sands and fine sands.

Seagrass beds

9.6.49. Seagrass beds provide a variety of ecosystem functions including shelter and foraging areas for a wide range of fauna and nurseries for fish. They also stabilise coastlines with their root systems, preventing erosion of the seabed and coast. Seagrasses grow in shallow coastal areas in sandy or muddy beds, sometimes together with maerl in exposed areas at low tides to maximum depths of 10 m.

9.6.50. They are very vulnerable to pollution (particularly elevated nitrates from urban or farm run-off), trampling and dredging, nearby coastal developments, and competition from INNS. In recognition of their ecological and economic importance, seagrass beds are a UK Biodiversity Action Plan (BAP) priority habitat[51] and are classed as a threatened and declining habitat by OSPAR[52].

9.6.51. While the intertidal validation survey did not record any seagrasses, two species are known in the Severn Estuary and inner Bristol Channel, namely common eelgrass *Zostera marina* and dwarf eelgrass *Zostera noltii.* The salt-tolerant tasselweed *Ruppia maritima* is also found, though generally not considered a marine species.

[51] UK BAP priority habitats are those identified as being the most threatened and requiring conservation action.
[52] OSPAR (2023). List of threatened and/or declining species and habitats. (Online). Available at: https://www.ospar.org/work-areas/bdc/species-habitats/list-of-threatened-declining-species-habitats (Accessed: August 2024).

Macrobenthic fauna

9.6.52. Epifauna are animals living on the surface of the sediment or as encrustations on rocks, shells and seaweed whereas infauna inhabit soft sediment. A total of 43 epifaunal species were recorded during several beam trawl surveys in 2008 and 2009 to inform the HPC ES. During these surveys the epifauna at Hinkley Point was found to be dominated primarily by the cumacean *Diastylis rathkei and* the common brown shrimp *Crangon crangon.*

9.6.53. Impingement and entrainment studies carried out at HPB for over two decades have provided information on some of the mobile epifauna captured at the cooling water intake. *C.crangon* was the most abundant species caught[53], with abundance varying temporally with spawning occurring in Spring and high numbers of juveniles causing a peak of abundance in Autumn[54]. The second most abundant species was the ghost shrimp *Pasiphaea sivado*, which is partially pelagic but rests on the seabed at night. Other common species caught at the intake screens included the demersal common prawn *Palaemon serratus* and pink shrimp *Pandalus montagui*, which have both shown a clear gradual trend of increasing abundance in the Severn. Abundance can vary seasonally in relation to migrations and the timing of reproduction and the subsequent occurrence of juveniles[54].

9.6.54. Some of these epifaunal species form an important component of the diet of other organisms. For example, *D.rathkei* is an important food source for bottom-feeding fish such as dab *Limanda limanda* and cod *Gadus morhua* whilst *C.crangon*, is also an important prey item for bottom-feeding fish such as cod, flatfishes and juvenile sea bass (*Dicentrarchus labrax*), as well as being preyed upon by seabirds. *N.nucleus* and *M.balthica* provide food for fish, other invertebrates and birds in intertidal environments.

9.6.55. The preferred habitat for *C.crangon* is sandy and muddy ground with a grain size range of 125 to 710 µm[55]. This species is highly intolerant of substrate loss, due to a decreased ability to forage and increased predation. However, this species exhibits rapid growth, early maturation and high fecundity, which allows rapid population recovery[70].

9.6.56. Henderson et al. in 2007 carried out a macrofaunal analysis and identified a total of 3,488 individuals and 61 taxa (excluding unquantifiable meiofauna and epifauna)[56]. Overall, the macrofauna was dominated by Annelida (69.9%) followed by Mollusca (19.9%) and Crustacea (2.9%). The remaining 7.25% of individuals comprised of Nematoda (1.4%), Nemertea, Actiniaria, Phoronida, Sipuncula and Pycnogonida (all <1%). In addition, at a single sampling location, high numbers of taxa generally associated with intertidal sediments were identified. These included Collembola (springtails), Chironomidae (non-biting midgies) and Acari (mites).

9.6.57. The most abundant taxon overall was the polychaete *Sabellaria alveolata*, comprising 28.2% of all individuals identified. However, this species was only present in five of the macrofaunal samples and

[53] Henderson, P.A., Seaby, R.M.H., & Soames, R. (2007). Fish and crustacean captures at Hinkley Point B Nuclear Power Station: Report for the year April 2006 to March 2007. (Online). Available at: https://powerstationeffects.co.uk/images/pdf/hinkfish2007.pdf (Accessed: August 2024)
[54] Henderson, P. A., Holmes, R. H. A. & Bamber, R. N. (1984). The species of fish and arthropods captured during cooling-water extraction by power stations in the Bristol Channel and Severn Estuary 1980–1984. Report of the Central Electricity Generating Board, U.K., TPRD/L.2694/N84, 10 pp.Google Scholar.
[55] Neal, K.J. (2008). *Crangon crangon* Brown shrimp. In Tyler-Walters H. Marine Life Information Network: Biology and Sensitivity Key Information Reviews, [on-line]. Plymouth: Marine Biological Association of the United Kingdom. [cited 26-01-2024]. (Online). Available at: https://www.marlin.ac.uk/species/detail/2031 (Accessed: August 2024).
[56] Dewey, S., MacMillan, A., and O'Dell, J. (2021). Hinkley Point B Marine Habitat Mapping Survey. A report to Wood Group UK by Seastar Survey Ltd. 55 pages.

also where biogenic reef features were evident from the acoustic data (and hence no PSA sub-samples could be collected). *S. alveolata* was also identified adjacent to the area of reef in the northwest of the survey area.

9.6.58. The oligochaete *Tubificoides amplivasatus* was also highly abundant, comprising 27.1% of all individuals identified, and was present in 14 of the 18 samples. The bivalve *M. balthica* was also abundant, comprising 18.3% of individuals identified and present in 13 samples, being absent only from those 5 samples where *S. alveolata* was present. Other relatively abundant taxa included the polychaete *Nephtys* spp., which was present in 14 samples, and the tube-dwelling worm *Pygiospio elegans*, which was only present in three samples, associated with high numbers of *S. alveolata.* Similarly, both *N.nucleus* and *M.balthica* inhabit the upper layers of sandy and muddy sediments and are considered to be intolerant to substrate loss, but both exhibit high rates of population recovery[55].

9.6.59. Species diversity (as measured by the Shannon-Wiener diversity index[57]) was highly variable between samples, ranging from a low of 0.521 to a high of 2.026. The stations with the lowest diversity were generally located in the north of the survey area (further away from shore).

Table 9-10 - Total microbenthic abundance (from 2020 habitat mapping survey)

Taxon[58]	Qualifier	Abundance (total no. in all samples)
Sabellaria alveolata		984
Tubificoides amplivasatus		945
Macoma balthica		638
Nephtys sp.	juv.	132
Collembola	indet.	111
Nephtys hombergii		107
Nereididae	juv.	88
Pygospio elegans		87
Nematoda	indet.	48
Chironomidae	larva	45

[57] A statistical measurement of the diversity of species in a community that considers both the total number of species and the proportion they contribute to the overall community.
[58] Taxa shown comprise 95% of total individuals identified.

Taxon[58]	Qualifier	Abundance (total no. in all samples)
Peringia ulvae		41
Diastylis rathkei		39
Polydora sp.	juv.	31
Acari	indet.	20

Fish

9.6.60. The broader fish population of the seven estuary and Bristol Channel, including Bridgwater Bay, is of a similar species composition to that of other estuaries and coastal regions in southwest England. The most common species are sprat (*Sprattus sprattus*) and Whiting (*Merlangius merlangus*), which are present in numbers an order of magnitude higher than the next most abundant species which are poor cod (*Trisopterus minutus*), sand goby (*Pomatoschistus minutus*), sea snail (*Liparis liparis*), pout (*T. luscus*) and sole (*Solea solea*) [59].

9.6.61. Ten marine species found within the area are UK Biodiversity Action Plan (BAP) species. These are:

- cod *(Gadus morhua);*
- herring *(Clupea harengus);*
- plaice *(Pleuronectesd platessa);*
- sole;
- whiting;
- blue whiting *(Micromesistius poutassou);*
- hake *(Merluccius merluccius);*
- horse mackerel *(Trachurus trachurus);*
- ling *(Molva molva);* and
- saithe *(Pollachius virens).*

9.6.62. The Severn Estuary Dataset (SEDS)[60] provides long-term data on the abundance and species richness of fish in the Inner Bristol Channel – a total of 83 estuarine and marine fish species have been recorded since surveys began[61].

9.6.63. Almost all known species of fish living within the Severn Estuary and inner Bristol Channel undertake regular migrations and tend to move seasonally in waves up and down the estuary. Both species richness and the total abundance reach a maximum in late summer and autumn, though timing of this peak varies between the upper and lower estuary[61].

[59] Henderson, P.A. (1989). On the structure of the inshore fish community of England and Wales. Journal of the Marine Biological Association of the United Kingdom, 69(1), pp.145-163.
[60] Medin (2022) Metadata: Severn Estuary Database Phase 2. (Online). Available at: https://portal.medin.org.uk/portal/start.php?tpc=007_4f4c4942-4343-5764-6473-303234323637&step=0017 (Accessed: August 2024).
[61] Henderson, P.A. and Bird, D.J. (2010). Fish and macro-crustacean communities and their dynamics in the Severn Estuary. Marine pollution bulletin. (Online). Available at: https://www.sciencedirect.com/science/article/abs/pii/S0025326X09005190 (Accessed: August 2024).

9.6.64. The estuary is also extensively used as a nursery ground for marine species due to the large areas of shallow marginal mudflat that provide feeding opportunities for juveniles. Few fish in Bridgwater Bay complete their entire life cycle in the area. Most marine species exploit the productivity of the intertidal areas as juveniles, moving in and out of the estuary and inner Bristol Channel seasonally in response to limitations of low temperature and salinity in the late winter.

9.6.65. Seven species of diadromous fish migrate through the estuary between their natal rivers (notably the Wye, Usk and Severn) and their marine feeding grounds. These are Atlantic salmon (*Salmo salar*), sea trout (*Salmo trutta*), European eel (*Anguilla anguilla*), twaite shad (*Alosa fallax*), allis shad (*A.alosa*), river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus).* Whilst the migratory routes of these species are not fully mapped, there is only limited evidence that they use inshore migratory routes, i.e. along the shoreline near HPB.

Marine mammals

9.6.66. A variety of marine mammals are recorded as being present either throughout the year, or seasonally, within the Bristol Channel. The most common species recorded in the Bristol Channel is the harbour porpoise (*Phocoena Phocoena*), followed by the common dolphin (*Delphinus delphis*). Other cetaceans occurring less frequently include Risso's dolphin (*Grampus griseus*), bottlenose dolphin (*Tursiops truncatus*) and Northern minke whale (*Balaenoptera acutorostrata*)[62].

9.6.67. Occasional sightings and strandings of long-finned pilot whale (*Globicephala melas*), fin whale (*Balaenoptera physalus*) and killer whale (*Orcinus orca*) have been recorded, although these remain scarce[63].

9.6.68. Of the pinnipeds, only the grey seal (*Halichoerus grypus*) is common in the Bristol Channel / Severn Estuary, though harbour seals (*Phoca vitulina*) do occur infrequently.

9.6.69. Although no specific marine mammal surveys have been undertaken at HPB, watches were conducted during the intertidal, benthic and boat-based water quality surveys undertaken in 2020-2022. No marine mammals were observed during these surveys, although it is noted that harbour porpoises were occasionally seen by ornithology and ecology teams working on the nearby HPC site during this period. Porpoises and seals are also known to occasionally enter tributaries such as the Parrett. Therefore, it is unlikely that many marine mammals will be in the vicinity of the Proposed Works at HPB.

Future baseline

9.6.70. The marine environment is currently undergoing unprecedented change at multiple levels due to stressors including biodiversity loss, climate change, overfishing, eutrophication, colonisation by alien species, habitat destruction (e.g. by coastal developments) and marine litter.

9.6.71. Climate change scenarios cannot be predicted with certainty, the Met Office has produced climate change projections for the 21st Century. For the Severn Estuary specifically, winter mean air temperature is predicted to increase by around 2.8°C by 2080, with summer mean temperature by around 3.9°C. Marine sea and air temperatures are projected to rise in response to land air temperature. The potential influence of projected climate change on future baseline conditions will

[62] Baines, M.E. & Evans, P.G.H. (2012). Atlas of the Marine Mammals of Wales. CCW Monitoring Report No. 68. 2nd edition. 139pp.
[63] Reid, J.B., Evans, P.G.H, Northridge, S.P. (2003). Atlas of Cetacean distribution in North West European waters, 76 pages, colour photos, maps. Paperback, ISBN 1 86107 550 2.

be considered further as part of the EIA (see **Chapter 6: Air Quality**) noting that once the marine infrastructure is decommissioned there should be very limited interaction of the Proposed Works with the marine environment.

9.6.72. The responses of marine biota to climate change are influenced by the physiological and behavioural effects of several variables, most notably sea temperature and ocean acidification. In addition, ecological interactions, such as changing predator-prey relationships will also affect the future distribution of some species (particularly fish and marine mammals). As these responses cannot be predicted, and the duration of the Proposed Works within the marine environment is short-term and temporary, it is appropriate to base the predicted future baseline status of habitats and species on the current status of these features.

9.6.73. It is worth noting that recent years have seen a marked increase in the abundance and species richness of fish in the Severn Estuary, which may be as much as a threefold increase compared to the early 1980s. Although this is partially attributable to improved water quality, increased temperature and decreased salinity appear to be the predominant environmental factors behind this change. To some extent this may also reflect the large natural interannual variations commonly observed in some species particularly pelagic fish[34].

9.6.74. The future marine baseline may also be influenced by changes as a result of the construction and operation of HPC. Whilst the majority of the marine infrastructure has now been installed (including the intake and outfall heads associated with the cooling water system), works associated with the fish return system have not yet commenced, and the temporary jetty built for HPC will also be removed. Further, once the HPC cooling water system is operational, there will potentially be localised changes to fish populations as a result of them being drawn into the system (although noting that mitigation measures, including the afore-mentioned fish return system) and/or potential changes in water temperature.

9.7 Embedded environmental measures

9.7.1. Embedded environmental measures proposed to reduce the likely impacts on marine biodiversity are outlined in **Table 9-11**.

Table 9-11 - Summary of embedded environmental measures

Embedded measure	Phase	Implementation
Limited use of anti-fouling materials Minimise the use of anti-fouling materials to reduce the amount of harmful chemicals / biocides released into the environment. For example, the AEDL and STP discharge line, which are expected to protrude from the end of the existing outfall infrastructure, use will be minimised to reduce the volume of harmful chemicals / biocides.	Preparations for Quiescence phase	Marine licence conditions EMP

Embedded measure	Phase	Implementation
The use of conventional methods The deck and surrounding piles of the cooling water intake structure will be removed using conventional methods, and not using explosives, which may include: use of (for example) diamond-wire cutting machines, vibro-piling to remove piles from the seabed, presence of jack-up vessels/ floating cranes/ guard vessels during the Proposed Works.	Preparations for Quiescence phase	EMP
Minimising subtidal working As much work as possible will be carried out from the shore, including work in the intertidal zone, where working 'in the dry' will minimise sediment mobilisation and facilitate avoidance of disturbance of sensitive features.	Preparations for Quiescence phase	EMP
Appropriate scheduling of works Through consideration of sensitive species, and general timings of the Proposed Works, potential effects can be minimised.	Preparations for Quiescence phase	Marine licence conditions
Adherence to standard pollution control measures All vessels and plant involved in the Proposed Works would be required to adhere to standard pollution control measures, such as those established under the International Convention for the Prevention of Pollution from Ships (MARPOL)[64] and the Ballast Water Convention[65].	Preparations for Quiescence phase	EMP

[64] International Convention for the Prevention of Pollution from Ships (MARPOL). (Online). Available at: https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx (Accessed: August 2024)]

[65] International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM). (Online). Available at: https://www.imo.org/en/About/Conventions/Pages/International-Convention-for-the-Control-and-Management-of-Ships%27-Ballast-Water-and-Sediments-(BWM).aspx (Accessed: August 2024).

Embedded measure	Phase	Implementation
Prevent further accidental spillage of contaminants Pollution risk and pollution controls will be managed in accordance with the IMS, which aligns to best practice guidance.	All phases	EMP
Natural infill with marine sediments Voids within the seabed beyond the intertidal area will not be plugged, instead, they will be left to infill naturally with marine sediments minimising further disturbance to the marine environment.	Quiescence phase and Final Site Clearance	EMP

9.8 Assessment methodology

9.8.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this marine biodiversity chapter, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the marine biodiversity assessment in this ES. These adaptations are described below.

9.8.2. The assessment is based on field surveys, relevant published information (for example on the status, distribution, sensitivity to environmental changes and ecology of the features scoped into the assessment, where this information is available), and professional knowledge of ecological processes and functions.

9.8.3. For each scoped-in ecological feature (see paragraph 9.9.7), potential effects have been assessed against the current baseline conditions and with respect to the Proposed Works.

9.8.4. Where part of a designated site is located within the ecological ZoI relating to a particular biophysical change, the effects on the designated site as a whole has been assessed. A similar approach has been taken for areas of notable habitat.

9.8.5. For species that occur within the ZoI, the assessment has considered the total area that is used by the affected individuals or the local population of the species (e.g. for foraging), rather than the footprint of the Proposed Works. This approach means receptors located far afield from the works are considered within the assessment.

Determination of significance

9.8.6. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[66] (hereafter referred to as "EIADR") recognises that decommissioning will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identify those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the Proposed Scheme*".

9.8.7. The EIADR does not define significance. The significance of an effect resulting from a development is determined in this assessment by reference to the sensitivity (or 'importance') of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Proposed Works.

9.8.8. Chartered Institute of Ecology and Environmental Management (CIEEM)[25] defines a significant effect as one "*that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general*".

9.8.9. When considering likely significant effects on ecological features, whether these be adverse or beneficial, the following characteristics of environmental change are taken into account[67]:

- extent – the spatial or geographical area over which the environmental change may occur;
- magnitude – the size, amount, intensity or volume of the environmental change;
- duration – the length of time over which the environmental change may occur;
- frequency – the number of times the environmental change may occur;
- timing – the periods of the day/year etc. during which an environmental change may occur; and
- reversibility – whether the environmental change can be reversed through restoration actions.

9.8.10. It is necessary to determine which ecological features are important in the context of the Proposed Works. Following CIEEM guidance, the importance of ecological features is first determined with reference to UK legislation and policy and then with regard to the extent of habitat or size of population that may be affected by the Proposed Works. This means that the level of importance can differ from that which would be conferred by legislative protection or identification as a conservation notable species alone. For example, a small population of a protected species that could be affected by a development would be assessed as being of less than national importance where there is suitable habitat nearby that has the capacity to support displaced individuals.

9.8.11. Wherever possible, information regarding the extent and population size, population trends and distribution of the ecological features has been used to inform the determination of importance described in **Table 9-12**. Where detailed criteria or contextual data are not available, professional judgement is used to determine the level of importance. This approach is an evolution of that presented in the Scoping Report; while the principles are the same, some details in the criteria have been more fully aligned with those used for terrestrial biodiversity. This is to ensure a greater consistency of the assessment across technical aspects, particularly where a receptor may be

[66] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999. (Online). Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed: April 2024).
[67] The definitions of the characteristics of environmental change are based on the descriptions provided in CIEEM 2018. Other chapters in this EIA Report may use some of the same terms albeit with a different definition.

considered both terrestrial and marine (e.g. seabirds). Further, it is noted that the ONR observed in its comments on the Scoping Report that "*The ES should provide further clarity on the term 'importance' in the context of a receptor sensitivity*."

9.8.12. The 'importance' of an ecological feature is categorised largely through consideration of its conservation status. This is because conservation status in the UK intrinsically embodies and integrates a variety of concepts including scarcity, naturalness, threat, resilience, ecological function and ecosystem services. Ecological features that are not considered 'important' are those which are sufficiently widespread, unthreatened and resilient, and whose viability will be unaffected by the Proposed Works. **Table 9-12** details the basis for assigning receptor importance.

9.8.13. Impacts on a species or habitat of lesser importance may have a consequent effect on a receptor of higher importance; for example, a reduction in the numbers of a common prey fish that in turn leads to the decline of a population of seabirds or marine mammals. It is therefore necessary to consider factors such as ecological services and trophic relationships within the assessment.

Table 9-12 - Importance of marine biodiversity features

Level of importance	Example criteria
Very high	▪ International sites including Ramsar sites and European sites including Special Protection Area (SPAs), SACs (including candidate/potential sites); and ▪ Based on field data collected to inform the assessment, areas of habitat or populations of species which meet the published selection criteria for designation as an international site, but which are not currently designated as such.
High	▪ Nationally designated sites including SSSIs and Marine Protected Areas (MPAs) and future Highly Protected Marine Areas (HPMAs) ▪ Areas (and the populations of species which inhabit them) which meet the published selection criteria Guidelines for Selection of Biological SSSIs[68] but which are not themselves designated based on field data collected; and ▪ Red listed and legally protected species that are not addressed directly in Part 2 of the "*Guidelines for Selection of Biological SSSIs*" but can be determined to be of national importance using the principles described in Part 1 of the guidance.
Medium	▪ Non-statutory designated sites; and ▪ Areas which (based on field data) meet the published selection criteria for those sites listed above (for habitats or species, including those listed in relevant Local Biodiversity Action Plans - LBAP) but which are not themselves designated.
Low	▪ Red listed and legally protected species that based on their extent, population size, quality etc. are determined to be of local interest. ▪ Common and widespread marine habitats and biotopes occurring in proportions greater than may be expected in the local context; and

[68] JNCC (2013). Guidelines for the Selection of biological SSSIs. (Online). Available at https://hub.jncc.gov.uk/assets/dc6466a6-1c27-46a0-96c5-b9022774f292 (Accessed: August 2024).

Level of importance	Example criteria
	▪ Common and widespread native species occurring in numbers greater than may be expected in the local context.
Very Low	▪ Common and widespread habitats, biotopes and species that occur in levels comparable to those of the surrounding area; and ▪ Areas of heavily modified or managed coast/seabed (e.g. coastal defence and other structures) where a more important species is not present.

Table 9-13 - Establishing the magnitude of change

Magnitude	Criteria
High	The change permanently (or over the long-term) affects the conservation status of a habitat/species, reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area and relative to the wider habitat resource/species population, a large area of habitat or large proportion of the wider species population is affected. For designated sites, integrity is compromised[69]. There may be a change in the level of importance of the receptor as a result of the Proposed Works.
Medium	The change permanently (or over the long term) affects the conservation status of a habitat/species reducing or increasing the ability to sustain the habitat or the population level of the species within a given geographic area and relative to the wider habitat resource/species population, a small-medium area of habitat or small-medium proportion of the wider species population is affected. There may be a change in the level of importance of this receptor as a result of the Proposed Works.
Low	The quality or extent of designated sites or habitats or the sizes of species' populations, experience some small-scale reduction or increase. These changes are likely to be within the range of natural variability and they are not expected to result in any permanent change in the conservation status of the species/habitat or integrity of the designated site. The change is unlikely to modify the evaluation of the receptor in terms of its importance as a result of the Proposed Works.
Very low	Although there may be some effects on individuals or parts of a habitat area or designated site, the quality or extent of sites and habitats, or the size of species populations, means that they would experience little or no change. Any changes are also likely to be within the range of natural variability and there would be no short-term or long-term change to conservation status of habitats/species receptors or the integrity of designated sites.

9.8.14. Adverse effects are assessed as being significant if the favourable conservation status of an ecological feature would be lost as a result of the Proposed Works. Beneficial effects are assessed

[69] With regards to designated sites, 'site integrity' relates to whether the site's conservation objectives are being met, or whether planned activities have the capacity to adversely affect the site's objectives. These conservation objectives can be generic or site-specific in nature. Examples from the Severn Estuary SAC include to "Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring: The extent and distribution of qualifying natural habitats and habitats of qualifying species; The structure and function (and typical species of qualifying natural habitats."

as those where a resulting change from baseline improves the quality of the environment (e.g. increases species diversity, increases the extent of a particular habitat etc., or halts or slows down an existing decline). For a beneficial effect to be considered significant, the conservation status would need to positively increase in line with a magnitude of change of "high" as described in **Table 9-14**.

9.8.15. Conservation status is defined as follows[70]:

- "For habitats, conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and typical species within a given geographical area;
- For species, conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area."

9.8.16. The decision as to whether the conservation status of an ecological feature would alter will be made using professional judgement, drawing upon the information produced through the desk study, field survey and assessment of how each feature is likely to be affected by the Proposed Works.

9.8.17. A similar procedure will be used where designated sites may be affected by the Proposed Works, except that the focus is on the effects on the integrity of each site; defined as:

- "The coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified".

[70] European Commission (2004). Directive 2004/35/CE of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32004L0035&qid=1626091552770 (Accessed: August 2024).

Table 9-14 - Significance evaluation matrix

		Magnitude of change				
		Very high	**High**	**Medium**	**Low**	**Very low**
Sensitivity/importance/value	**Very high**	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

9.8.18. The assessment of effects on integrity draws upon the assessment of effects on the conservation status of the features for which the Site has been designated. Where these features are not clearly defined, which can be the case for non-statutory designated sites, it is necessary to use professional judgement to identify the interest features. This judgement is augmented, where possible, by additional contextual information about such features provided by the relevant organisations (including, for example JNCC, Natural England or the Local Planning Authority, which in this case is the Somerset Council) who are responsible for identifying such sites. The principle is that the baseline information used for the assessment is as comprehensive as possible.

9.9 Assumptions and limitations

9.9.1. Limitations relating to the baseline data underlying the assessment are identified in **Section 9.4**. There are no further assumptions or limitations associated with this chapter.

9.10 Scope of the assessment

9.10.1. The Proposed Works related to the marine environment involve the demolition of the cooling water intake structure and associated works, and the installation of the new AEDL and STP discharge line, via the existing outfall tunnel during the Preparation for Quiescence phase.

Study Area

9.10.2. The Proposed Works may result in a variety of environmental changes such as direct loss of habitat/species and indirect effects such as noise etc. Each of these impacts will have a spatial dimension that varies according to the scope of the activity and the nature of the receptor. In order to assess the resultant effects, a series of ZoIs are described that form the basis of the Study Area.

9.10.3. The determination of a Study Area for each important ecological feature therefore is key to establishing which environmental changes may result in likely significant effects. The Study Areas differ depending on the type of environmental change (e.g., the change from the existing baseline) as a result of the Proposed Works and the ecological feature being considered.

9.10.4. The most straightforward Study Area to define is the area affected directly by the Proposed Works and direct habitat changes as a result of these works. This Study Area is the same for all affected ecological features and comprises the footprint of the Works Area below MHWS. Species-specific Study Areas are presented in **Table 9.4**.

9.10.5. For each environmental change that extends beyond the area affected directly by the Proposed Works (e.g., increased noise), the Study Area varies according to receptor, depending on their sensitivity to the change and the precise nature of the change. For example, fish and marine mammals have different hearing capabilities and a marine mammal may be disturbed by underwater noise several kilometres from the noise source (dependent on the source to a variable extent), while other species (e.g., many invertebrates) may be unaffected by noise. In view of these complexities, the definition of Study Areas (as detailed in **Table 9.2**) beyond the Proposed Works footprint has been based on expert judgement informed by a review of appropriate evidence where available (e.g., disturbance criteria for various species).

9.10.6. The temporal scope of the assessment covers the duration of all activities carried out within the decommissioning period as described in **Chapter 2: The Decommissioning Process**.

Potential receptors

9.10.7. The following key marine biodiversity receptors have been identified as relevant to this assessment. With the Severn Estuary SAC adjacent to the Works Area to the north and east, there is potential for marine and intertidal qualifying features to be affected by the Proposed Works:

- intertidal habitats and associated species;
- subtidal benthic habitats and associated species;
- fish;
- coastal vegetation; and
- marine mammals.

9.10.8. Where a receptor is too distant or no pathway of effect is deemed to exist, it was excluded from assessment at the scoping stage. Therefore, European sites are not considered here, due to the small geographic scale and magnitude of the works (i.e. the applicable ZoI for relevant qualifying features does not bring them into the scope of the assessment). Additional detail is given in the Habitats Regulations Assessment (HRA) Screening Report accompanying this EIA.

Likely significant effects

9.10.9. The likely significant marine biodiversity effects that have been taken forward for assessment in this chapter are summarised in **Table 9-15**.

9.10.10. Effects relate primarily to the Preparations for Quiescence phase, when actual marine interventions will occur, with no likely significant effects identified during the Quiescence and Final Site Clearance phases.

Table 9-15 - Likely significant effects on marine biodiversity

Project task	Activity	Potential impact
Installation of AEDL and STP discharge line during Preparations for Quiescence phase	▪ Installation works occurring in the intertidal zone at low tide ▪ Both lines will be installed at the same time	▪ Effects of increased underwater noise on noise-sensitive receptors, resulting in disturbance / harm to marine fauna
Decommissioning of marine infrastructure during Preparations for Quiescence phase	▪ Removal of intake to seabed level, or a suitably safe level below the seabed ▪ Minor seabed preparation works for decommissioning ▪ Capping of intake and outfall structures from the landward side	▪ Direct disturbance, degradation or loss of subtidal / intertidal habitats ▪ Resuspension of sediment leading to mobilisation of contaminants and effects of reduced water quality on habitats / species ▪ Smothering of benthic habitats / species by resettlement of suspended material ▪ Effects of increased underwater noise on noise-sensitive receptors, resulting in disturbance / harm to marine fauna
Removal of marine infrastructure through conventional methods during Preparations for Quiescence phase	▪ The presence of anchored pontoons ▪ Demolition of intake structure to seabed level ▪ Loading the debris from the seabed onto barge	▪ Degradation of subtidal / intertidal habitats and adverse effects on associated species due to sediment remobilisation ▪ Effects of increased underwater noise on noise-sensitive receptors, resulting in disturbance / harm to marine fauna
Onshore demolition during Preparations for Quiescence phase	▪ Demolition wastes and site runoff	Sediment laden or contaminated runoff released into the marine environment, with associated increase in sediment

Project task	Activity	Potential impact
		loads and potential contamination of the marine environment
Ground remediation during Final Site Clearance phase	▪ Methods to be determined	Sediment-laden or contaminated runoff released into the marine environment with subsequent effects on marine habitats and species
Building demolition during Final Site Clearance phase	▪ Movement of plant, demolition wastes within the Works Area and the use of cranes and other engineering equipment	Sediment-laden or contaminated runoff released into the marine environment, with subsequent effects on marine habitats and species.

9.11 Assessment of effects

9.11.1. This section provides an assessment of the likely effects on marine biodiversity arising from the removal of the intake structure to seabed level and the implementation of the AEDL and STP discharge line via the existing outfall tunnel, to the Severn Estuary. As per **Chapter 2: The Decommissioning Process**, optioneering with respect to the final design for the AEDL and the STP discharge line is ongoing. To ensure a reasonable worst-case assessment, it is therefore assumed that the AEDL and the STP discharge line will be laid beyond the existing tunnel entrance and discharge at the end of the existing CW Outfall Channel, approximately 220 m beyond the CW Outfall (approximately 400 m from the Sea Wall).

9.11.2. The impacts on coastal processes and water quality are addressed in **Chapter 10: Coastal Management and Water Quality.** This substantially informs the marine biodiversity assessment, particularly with respect to secondary impacts from changes to hydrodynamics and coastal processes, none of which have been assessed as significant.

9.11.3. The relevant impacts identified for this chapter take place during the Preparation for Quiescence and Final Site Clearance phase of the Proposed Works (see **Table 9-16**) and these are assessed for each receptor identified in paragraph 9.10.7. It is clear that the most significant impact pathways would be experienced during the Preparations for Quiescence phase for all receptors due to this phase including the decommissioning and removal of marine infrastructure.

Intertidal habitats/species

Decommissioning and removal of marine infrastructure through conventional methods during the Preparations for Quiescence phase

9.11.4. The Proposed Works within the marine environment are located predominantly on littoral mud and sand with *Sabellaria* aggregations, some of which are reefs, interspersed. Intertidal habitats and species have been categorised as being of medium importance. The localised nature of the Proposed Works is expected to result in temporary small changes to the sediment with minimal implications for the reefs.

9.11.5. The large tidal range of the estuary and inner Bristol Channel leads to very strong currents throughout the main body of the estuary. The intertidal biota of the estuary is therefore adapted to large magnitude natural changes. Considering the location of the Proposed Works, the magnitude of

change on littoral transport to these habitats is considered to be within the range of natural variability, i.e. very low.

9.11.6. Similarly, a temporary and localised increase in suspended sediment levels as a result of the Proposed Works will not directly impact the biotopes in the surrounding area. This is because the existing background level of suspended material is high and the small quantity that might be transported does not represent an appreciable change.

9.11.7. Once the marine elements of the Proposed Works have ceased, natural recovery of any affected areas would be expected to commence immediately, with recolonisation from neighbouring undisturbed areas by motile[71] species. Therefore, sediment remobilisation will have a very low magnitude of change and thus negligible (**Not Significant**) effect on intertidal receptors.

Onshore demolition works and ground remediation during the Preparations for Quiescence and Final Site Clearance phases

9.11.8. Run-off from potentially contaminated land due to the demolition of land-based infrastructure will be controlled using standard site management practices and the risk of such run-off is thus considered to be low risk with the appropriate embedded mitigation measures in place. The embedded pollution control measures set out in **Table 9-11** and secured within the Environmental Management Plan (EMP) would be implemented and adhered to throughout all demolition activities on land. Furthermore, works will, where practical, be conducted at low tide within the existing channel.

9.11.9. Considering the distance from land-based decommissioning works to the intertidal habitats, their intermittent nature, and the embedded measures for managing site drainage and runoff, the magnitude of change is predicted to be very low and therefore any effects will be negligible (**Not Significant**).

9.11.10. Residual effects of the works to intertidal habitats and species (being of medium importance) will be negligible (**Not Significant**).

Subtidal habitats/species

Decommissioning and removal of marine infrastructure through conventional methods during the Preparations for Quiescence phase

Loss of habitat

9.11.11. The Severn Estuary is one of the few places where *S.alveolata* reefs also occur extensively in both subtidal and intertidal zones[43]. Although the reefs are not a nationally important feature, being outside the boundary of the SSSI, they are a qualifying feature in the European Site Objectives for the Severn Estuary/Mor Hafren Special Area of Conservation[72]. Habitat loss resulting from the removal of structures at seabed level or below the seabed, and minor seabed preparations (as detailed in **Table 9.16**) will not have an effect on *Sabellaria* reefs (biotope **LS.LBR.Sab.Salv** "*Sabellaria alveolata* reefs on sand-abraded eulittoral rock"), and the marine communities that rely on them for feeding or shelter.

[71] In ecology, refers to organisms capable of motion (even those that tend not to move), to distinguish them from sessile organisms that cannot alter their position.
[72] European Site Conservation Objectives for Severn Estuary SAC (UK0013030) (2014). (Online). Available at: https://publications.naturalengland.org.uk/publication/6081105098702848 (Accessed: August 2024).

9.11.12. The sandy and muddy biotopes within the Works Area are common and widespread, occurring in levels comparable to those of the surrounding area, and thus of negligible importance with respect to this assessment.

9.11.13. The very low to regional (medium) importance of the receptors (depending on biotope) and the very low magnitude of change means that the effects of loss of subtidal habitat will be negligible (**Not Significant**).

9.11.14. The limited scale and duration of the Proposed Works will not result in significant habitat damage or loss. Therefore, effects on benthic species associated with these habitats as a result of seabed works will similarly be insignificant. The magnitude of change is assessed as very low and the resultant effects will be negligible (**Not Significant**).

Physical disturbance and degradation in habitat quality

9.11.15. The dismantling and decommissioning of marine structures will be completed utilising long reach excavators working from anchored pontoons. Structures will be demolished to seabed level and the debris loaded from the seabed on to a barge for disposal. The section of the caisson protruding above the seabed will be broken out by the excavators and the debris allowed to fall into the shaft of the Intake Tunnel. Divers will be deployed to inspect the work face before and after the works.

9.11.16. Seabed intervention will be minimal, mostly in relation to placement of the anchoring structures for the pontoons and recovery of debris from the seabed, which may cause a localised temporary resuspension of solids and increased turbidity. Sediment resuspension may temporarily affect certain species such as the polychaetes *Nephtys spp.* and *P. elegans*, the annelids *S.shrubsolii* and *Tubificoides* spp and the bivalve mollusc *M.balthica*. These receptors are of very low importance as they are common and widespread native species that do not occur in unusually large numbers in this location, and because of their ability to fully recover.

9.11.17. Increased turbidity may reduce the feeding efficiency of filter and deposit feeders by reducing the nutritional value of the suspended matter. However, they are not solely reliant on organic particles and also incorporate free-floating micro-organisms into their diet. Whilst it has been observed that increased turbidity may reduce growth and increase mortality of some deposit feeders, this is in circumstances where high concentrations have occurred over protracted periods[73]. Therefore, the magnitude of change due to a temporary and localised increase in turbidity, within an existing highly turbid environment, is considered very low.

9.11.18. Similarly, the highly localised increased suspended sediment and re-deposition and general resilience and pre-adaptation of the benthic fauna to turbid conditions means the magnitude of change due to sediment suspension and resettlement is considered to be very low.

9.11.19. The ability of benthos to recover is based on a combination of the environmental conditions of the Site, the frequency (repeated disturbances versus a one-off event) and the intensity of the disturbance, as well as the resilience of the species in question. The re-colonisation potential differs between those species that recruit from dispersed larvae (such as for *Pygospio elegans*) and those dependent on local populations (such for the infaunal deposit feeders *M.balthica*. In high energy environments full recoverability can take <2 years and in lower energy environments this can take

[73] Nicholls, P., Hewitt, J. and Halliday, J. (2003) Effects of suspended sediment concentrations on suspension and deposit feeding marine macrofauna. Aukland Regional Council Technical Publication No. 211 August 2003.

between 2-10 years[74]. The Works Area is a moderately high energy environment. Recovery would be expected in approximately two years. Therefore, the magnitude of change due to physical displacement is considered to be low.

9.11.20. Any seabed disturbance will be localised and suspended sediments readily dispersed by the high-water flow in the environment. Considering the very low to medium importance of the receptors (depending on the biotopes present, see above) and the very low magnitude of change due to physical disturbance, the residual effects are assessed as negligible (**Not Significant**).

Onshore demolition works and ground remediation during the Preparations for Quiescence phase and Final Site Clearance phase

9.11.21. The demolition of land-based infrastructure has limited scope to affect the marine environment, largely confined to the potential impacts of site drainage/runoff and possible non-routine events.

9.11.22. All land-based run-off will be treated using silt traps and oil separators and demolition activities managed using standard good site practice (e.g. appropriate bunds around fuel storage, etc.). Further details are provided in **Chapter 12: Soils, Geology and Hydrogeology.** No significant impacts will result from these activities.

9.11.23. Due to the relatively high energy marine environment, any treated runoff will disperse rapidly with the tide. A single tidal excursion extends approximately 2.5 km in this area. The magnitude of change due to runoff is considered to be very low, and when aligned with the very low to medium importance of the marine biodiversity features (biotopes) present the resultant effects are negligible (**Not Significant**).

Fish

Decommissioning and removal of marine infrastructure through conventional methods during Preparations for Quiescence phase

9.11.24. A wide variety of commercial and non-commercial fish species typically frequent the habitats and sedimentary substrates, including species listed in the JNCC List of UK BAP Priority Fish Species,[75] albeit in low numbers. The receptor is therefore considered of regional (medium) importance.

9.11.25. While the wider Severn Estuary supports several migratory fish species, as described in **Section 0**, there is currently limited evidence of significant inshore migration routes along the coast near HPB. Seabed intervention may cause a temporary resuspension of solids and increased turbidity as well as underwater noise.

9.11.26. Migratory fish species are listed in the JNCC UK BAP Priority Fish Species document[75] and protected under the Conservation (Natural Habitats, &C.) Regulations ·. The European eel, although not protected under the Habitats Regulations, is considered a critically endangered species. However, the Study Area does not feature a significant population of these species and therefore the receptor is considered of regional (medium) importance.

[74] De-Bastos, E. & Rayment, W.J. (2022). Semi-permanent tube-building amphipods and polychaetes in sublittoral sand. In Tyler-Walters H. and Hiscock K. (eds) Marine Life Information Network: Biology and Sensitivity Key Information Reviews. Plymouth: Marine Biological Association of the United Kingdom. (Online). Available at: https://www.marlin.ac.uk/habitat/detail/136 (Accessed: August 2024).
[75] UK Biodiversity Action Plan: List of UK BAP Priority Fish Species (2007). (Online). Available at: https://data.jncc.gov.uk/data/98fb6dab-13ae-470d-884b-7816afce42d4/UKBAP-priority-fish.pdf (Accessed: August 2024).

9.11.27. Underwater noise and vibration from excavators, pulverisers and breakers operating on the anchored pontoons may cause temporary behavioural disturbance and displacement of fish in the Study Area. Fish have a lower frequency auditory range than marine mammals, usually between 800 to 1,000 Hz (dependant on species)[76]; however, they can hear sounds over 2 km (source specific). Although fish with or without swim bladder perceive sounds differently, a precautionary threshold of 150 dB re 1 µPa for temporary risk of behavioural effects to fish and damage to eggs has been attributed for both impulsive and continuous sounds[77]. Suggested thresholds for the onset of injury to fish due to impulsive sound are 186 SEL, dB re 1 µPa2s (impairment) and a peak of 207 SEL, dB re 1 µPa2s (mortality)[78].

9.11.28. It is not anticipated at this stage that noise transmitted underwater from plant on the pontoons will be of sufficient magnitude to cause appreciable impairment to fish. With the appropriate noise management measures in place (including the use of conventional methods described in **Table 9-12)** noise will not exceed these thresholds, so the magnitude of change from underwater noise is low, therefore the effect on regionally important migratory fish is minor adverse (**Not Significant**).

9.11.29. As discussed under subtidal habitats above, the Proposed Works will create limited and temporary resuspension of sediments from the removal of seabed structures. These activities may result in some displacement of fish within the Study Area. The Severn Estuary is a relatively turbid area within which fish are acclimated to. Furthermore, the habitats potentially impacted are widespread and it is expected that most fish would relocate temporarily to adjacent areas with a lower level of disturbance during any periods of high loadings of suspended sediment. Fish communities will not experience widespread or long-term changes as the duration of the Proposed works will be of a short duration, therefore the magnitude of change is considered low. The resultant effects are therefore assessed as minor (**Not Significant**).

9.11.30. The localised scale of the Proposed Works and the low numbers of fish migrating, along with the seasonal nature of the sensitive period means that impacts can be readily mitigated through appropriate scheduling of the Proposed Works.

Onshore demolition works and ground remediation during Preparations for Quiescence phase and Final Site Clearance phase

9.11.31. Demolition and other decommissioning activities in the terrestrial environment will be controlled through embedded mitigation measures as outlined within **Chapter 11: Surface Water and Flood Risk**, thereby reducing the risk of runoff occurring. As previously described, where runoff and site drainage does occur, this will affect a very localised area (tens of metres) and is not considered to have any implications for fish.

9.11.32. With the appropriate measures secured via an EMP in place, the potential for demolition of land-based infrastructure to impact the fish community is very low. Therefore, the magnitude of change is

[76] Popper AN, Hawkins AD, Sand O, Sisneros JA. (2019). Examining the hearing abilities of fishes. J Acoust Soc Am. Aug;146(2):948. (Online). Available at: Examining the hearing abilities of fishes - PubMed (nih.gov). (Accessed August 2024).
[77] WSDOT (2011). Biological Assessment Preparation for Transport Projects - Advanced Training Manual. Washington State Department of Transport.
[78] Xodus (2015). Marine noise inputs Technical Note on Underwater Noise Statoil ASA. (Online) Available at: https://marine.gov.scot/sites/default/files/underwater_noise_technical_assessment_a-100142-s20-tech-001-a01_0.pdf (Accessed: August 2024).

very low and there will be negligible (**Not Significant**) effects on the fish community (being of medium importance) from deplanting and demolition works.

Marine mammals

Decommissioning and removal of marine infrastructure through conventional methods during the Preparations for Quiescence phase

9.11.33. Marine mammals are highly mobile species and may travel great distances searching for feeding grounds or for breeding. Critical habitats for marine mammals are those areas used regularly for feeding, breeding, raising calves and socialising, as well as for migrating. These are essential for the day-to-day well-being and survival of the species which helps maintaining a healthy population growth rate.

9.11.34. The Severn Estuary is not known as a particularly important feeding ground for cetaceans, and there are no major seal haul outs. Nonetheless, the grey seal, harbour porpoise, common and bottlenose dolphin have been recorded regularly (usually between March to September) and harbour seals have occasionally been observed. All the species mentioned are EPS, UK BAP Priority Species[79] and listed in the Conservation (Natural Habitats, &C.) Regulations 2017[14] Since the local populations are not of national importance and the species are not on the IUCN Red List, they are considered of medium importance.

9.11.35. The Severn Estuary is naturally a highly turbid body of water due to its physical shape, tidal regime and flow rates[80]. Therefore, any marine mammals that may occasionally enter the Works Area will be habituated to the high levels of sediment within the water column. The temporary localised increase in turbidity levels from the Proposed Works will therefore not have a significant impact.

9.11.36. Underwater noise may pose various risks to marine mammals, ranging from disorientation, disturbing their prey, to causing auditory impairments leading to strandings and/or death in extreme cases. Bottlenose and common dolphins, as well as harbour porpoise are “high-frequency” marine mammals (i.e. those with a hearing range between 75 Hz-150 kHz). Underwater noise exposure sensitivity differs according to the type of fatiguing sound, however, as a precautionary measure it is considered that the harbour porpoise is sensitive to underwater noise above the 100 dB re 1 µPa threshold on a frequency range from 10 to 130 kHz. Any increase of 40-50 dB above this threshold can lead to behavioural disturbance[81,82]. The same noise threshold c an apply to the dolphin species as well[83]. It is not expected that the Proposed Works will create

[79] UK Biodiversity Action Plan: List of UK BAP Priority Marine Species (2007). (Online). Available at: List of UK BAP Priority Marine Species (2007) (jncc.gov.uk) (Accessed: August 2024).
[80] Manning, A.J., Langston, W.J., Jonas, P.J.C. (2010). A review of sediment dynamics in the Severn Estuary: Influence of flocculation. Marine Pollution Bulletin. Volume 61, Issues 1-3, Pages 37-51.
[81] Tougaar, J et. Al (2014). Cetacean noise criteria revisited in the light of proposed exposure limits for harbour porpoise. (Online). Available at: https://www.researchgate.net/publication/268526670_Cetacean_noise_criteria_revisited_in_the_light_of_proposed_exposure_limits_for_harbour_porpoise (Accessed: August 2024).
[82] Jakob Tougaard (2021). Thresholds for noise induced hearing loss in marine mammals. Background note to revision of guidelines from the Danish Energy Agency. Aarhus University, DCE - Danish Centre for Environment and Energy, 34 s. – Scientific note no. 2021|28. (Online). Available at: Thresholds for noise induced hearing loss in marine mammals (au.dk) (August 2024).
[83] S. H. Ridgway and D. A. Carder (1996) Hearing deficits measured in some Tursiops truncatus, and discovery of a deaf/mute dolphin. (Online). Available at: https://www.freemorgan.org/wp-content/uploads/2012/10/ridgway___carder_1996_tursiops_deaf__mute.pdf (Accessed: August 2024).

noise levels above these thresholds, thus the magnitude of change due to temporary, intermittent and limited duration underwater noise from decommissioning activities is considered to be low.

9.11.37. Considering the low population of marine mammals using the Study Area, the temporary nature of the Proposed Works and consequently, the impacts on marine mammals are anticipated to be low. Therefore, the resultant effects on marine mammals from the decommissioning works will be minor (**Not Significant**).

Onshore demolition works and ground remediation during Preparations for Quiescence phase and Final Site Clearance phase

9.11.38. The potential for contaminated runoff will be reduced through implementation of the embedded environmental measures outlined within **Chapter 11: Surface Water and Flood Risk**. Where it does occur, it would affect a very localised area only, as it will disperse rapidly due to the relatively energetic marine environment and tidal regime. Resultant water quality impacts are thus not considered to have any implications for marine mammals. The magnitude of change due to runoff is considered to be very low and the resultant effect negligible (**Not Significant**).

9.12 Transboundary Effects

Transboundary effects associated with Proposed Works are considered in **Appendix 5D**. The largest Study Area is associated with the marine biodiversity assessment is 200 km for migratory fish and cetaceans. However, as the effects of Proposed Works in the marine environment are described as localised and temporary, the assessment concludes that there are no likely significant effects.

9.1 Summary

Table 9-16 - Summary of the assessment of effects

Receptor	Receptor importance	Activity	Impact	Magnitude of change	Significance of effect
Intertidal habitats / species	Medium	Decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase	Smothering from increased sedimentation Loss of *Sabellaria* biotopes	Very low	Negligible (not significant)
		Onshore demolition works and ground remediation during the Preparations for Quiescence and Final Site Clearance phases	Loss of *Sabellaria* biotopes	Very low	Negligible (not significant)
Subtidal habitats / species	Very low to Medium	Decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase	Loss of habitat Physical disturbance and degradation in habitat quality	Very low	Negligible (not significant)
		Decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase: Discharges from vessels		Very low	Negligible (not significant)
		Onshore demolition works and ground remediation during the		Very low	Negligible (not significant)

Receptor	Receptor importance	Activity	Impact	Magnitude of change	Significance of effect
		Preparations for Quiescence phase and Final Site Clearance phase			
Fish	Medium	Decommissioning and removal of marine infrastructure	Effects of underwater noise on hearing sensitivity and behaviour	Low	Minor (not significant)
		Onshore demolition works and ground remediation during Preparations for Quiescence phase and Final Site Clearance phase	Increased sedimentation	Very low	Negligible (not significant)
Marine mammals	Medium	Decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase	Effects of underwater noise on hearing sensitivity and behaviour	Low	Minor (not significant)
		Onshore demolition works and ground remediation during Preparations for Quiescence phase and Final Site Clearance phase	Increased sedimentation	Very low	Negligible (not significant)

9.13 Assessment of cumulative effects

Inter-project effects

9.13.1. There is the potential for marine biodiversity effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

9.13.2. An assessment inter-project effects is considered within in **Chapter: 21: Cumulative Effects Assessment** of this ES.

Intra-project effects

9.13.3. The assessment contained within this chapter has inherently considered the potential impacts of various aspects of the Proposed Works, including underwater noise and changes to coastal processes, water quality and groundwater quality on sensitive marine biodiversity receptors. Therefore, the potential for intra-project impacts has been captured within **Section 9.11**.

9.13.4. A summary of the potential intra-project effects is provided in **Chapter 21: Cumulative Effects Assessment.**

10

Coastal Management and Water Quality

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10 Coastal Management and Water Quality

10.1 Introduction

10.1.1. This chapter presents the assessment of effects of the Proposed Works with respect to coastal management and water quality. It describes the key receptors and coastal process pathways in the vicinity of the Indicative Dismantling Works Area (hereafter referred to as the "Works Area") and should be read in conjunction with the description of the Proposed Works presented in **Chapter 2: The Decommissioning Process** and with respect to relevant parts of other environmental aspect chapters, including in particular **Chapter 9: Marine Biodiversity**, **Chapter 11: Surface Water and Flood Risk** and the **Habitats Regulations Assessment (HRA) Appraisal**, where common receptors have been considered or where there is a potential inter-relationship with respect to the assessment of effects.

10.1.2. This chapter describes the coastal processes and marine water quality within the Severn Estuary and the Bristol Channel which could potentially be affected by the Proposed Works. It examines the potential for changes in coastal processes and marine water quality resulting from the dismantling and decommissioning of the existing marine infrastructure, comprising the cooling water (CW) intake and outfall (and associated infrastructure) seaward of the Hinkley Point B Power Station (HPB) Nuclear Site Licence (NSL) Boundary (hereafter referred to as "the Site").

10.1.3. This chapter is supported by the following figures provided in Volume II of this ES:

- **Figure 10.1:** Marine biodiversity sites; and
- **Figure 10.2:** Marine water quality monitoring locations.

10.1.4. This chapter is also supported by the following appendices provided in Volume III of this ES:

- **Appendix 10A:** Results from the Water Quality Surveys; and
- **Appendix 10B:** Water Framework Directive Appraisal.

10.2 Relevant legislation, policy and technical guidance

Legislation

10.2.1. The legislation in **Table 10-1** is relevant to the assessment of the effects on coastal management and water quality receptors:

Table 10-1 - Legislation relevant to coastal management and water quality

Legislation	Legislation relevance
Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy (Water Framework Directive)[1] The WFD is transposed into UK law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017[2]	The Water Framework Directive 2000/60/EC (WFD) is an EU directive committing European Union member states to achieve good qualitative and quantitative status of all water bodies, including marine surface waters up to one nautical mile from shore (in England and Wales), with a requirement for compliance with parameters contributing to chemical status up to 12 nautical miles from the shore. Further details of the assessment criteria are included in the WFD compliance assessment presented in **Appendix 10B**. Although the UK has now left the EU, the provisions of the WFD are currently retained in English legislation. The main aims of the WFD relevant to the coastal management and water quality assessment are to: ▪ prevent deterioration and enhance the status of aquatic ecosystems; ▪ promote sustainable water use; ▪ reduce pollution; and ▪ contribute to the mitigation of floods and droughts. The WFD addresses ecological, physico-chemical, quantitative and morphological aspects of the water environment and requires that improvements take account of economic aspects, including costs and benefits as a means of encouraging sustainable use of water resources. Managing water environments based on natural river basin districts must be underpinned by extensive environmental monitoring and scientific investigation through River Basin Management Plans (RBMP). This assessment considers whether is the Proposed Works are likely to affect compliance with the aims of the WFD or implementation of the South West or Severn RBMPs. Implementation of the WFD's objectives was extended until 2027. The requirement to develop a second RBMP running from 2021–2027 is set out in domestic law and so the UK's obligations to produce a plan still apply.

1 The European Commission (2000). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. As amended by Directives 2008/105/EC and 2013/39/EU and 2014/101/EU. Available at: https://eur-lex.europa.eu/resource.html?uri=cellar:5c835afb-2ec6-4577-bdf8-756d3d694eeb.0004.02/DOC_1&format=PDF (Accessed August 2023)

2 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (S.I. 2017:407) Available online at https://www.legislation.gov.uk/uksi/2017/407/contents (Accessed August 2024)

Legislation	Legislation relevance
The Bathing Water Regulations 2013 (as amended)[3]	The Regulations require the designation of areas of surface water (coastal or inland) as a bathing water if large numbers of people are expected to bathe there, based on previous trends, infrastructure, or facilities, including measures to promote bathing at the site. Once designated, there is a requirement for annual monitoring to be undertaken, classifying the area as excellent, good, sufficient or poor, based on measurements taken over a four-year period, and for notification of the public and implementation of management measures where quality is assessed as poor. No designated bathing waters are located within 2km of the Proposed Works, with the nearest Bathing Water located ~13km (by sea) north-north-east at Berrow within the Parrett transitional WFD water body.
Marine and Coastal Access Act 2009 (MCAA) (as amended)[4]	The MCAA introduced a revised system of marine management and licensing, including marine planning which makes provisions for general government marine environment policies, as well as those policies of the devolved administrations. It also made changes to the management of marine, migratory and freshwater fisheries, marine conservation, as well as recreational access to the English and Welsh coasts.
Flood and Water Management Act 2010 (as amended)[5]	The Flood and Water Management Act 2010 (as amended) updates arrangements for addressing coastal flood and erosion risk management which includes when a development when discharging their flood or coastal erosion risk management functions.
The Environmental Permitting (England and Wales) Regulations 2016 (as amended)[6]	Water discharge activity is defined under Schedule 21, Paragraph (3)(1)(a) as: "*the discharge or entry to inland freshwaters, coastal waters or relevant territorial waters of any (i) poisonous, noxious or polluting matter, (ii) waste matter, or (iii) trade effluent or sewage effluent.*" These Regulations require operators of facilities that could harm the environment or human health to obtain permits (which includes permits for the disposal or

3 The Bathing Water Regulations 2013 (S.I. 2013:1675). Available online at https://www.legislation.gov.uk/uksi/2013/1675/contents (Accessed February 2024).

4 Marine and Coastal Access Act (2009). Available online at: http://www.legislation.gov.uk/ukpga/2009/23 (Accessed January 2024).

5 Flood and Water Management Act (2010). Available online at http://www.legislation.gov.uk/ukpga/2010/29 (Accessed January 2024).

6 The Environmental Permitting (England and Wales) Regulations (2016). Available online at: https://www.legislation.gov.uk/uksi/2016/1154/contents/made (Accessed January 2024).

Legislation	Legislation relevance
	discharge of radioactive waste and discharges) for these facilities or to register others as exempt – the regime also provides for on-going supervision by regulators.

Policy

10.2.2. A summary of the relevant policies is presented in **Table 10-2**.

Table 10-2 - Policy relevant to coastal management and water quality

Policy Reference	Policy Relevance
National Policy	
National Planning Policy Framework (NPPF) (2023)[7]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works. Paragraph 178 requires that development proposed in a Coastal Change Management Area[8] to demonstrate that: a) it will be safe over its planned lifetime and not have an unacceptable impact on coastal change; b) the character of the coast including designations is not compromised; c) the development provides wider sustainability benefits; and d) the development does not hinder the creation and maintenance of a continuous signed and managed route around the coast. Paragraph 179 goes on to state "*Local planning authorities should limit the planned lifetime of development in a Coastal Change Management Area through temporary permission and restoration conditions, where this is necessary to reduce a potentially unacceptable level of future risk to people and the development.*"

7 The National Planning Policy Framework (NPPF) (2023). Available online at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf (Accessed August 2024).

8 An area identified in plans as likely to be affected by physical change to the shoreline through erosion, coastal landslip, permanent inundation or coastal accretion

Policy Reference	Policy Relevance
Local Policies	
Adopted West Somerset Local Plan to 2032 (2016)[9]	Policy CC3 protects new and existing developments from flood risk arising from increasing sea levels and the effects of coastal erosion in accordance with the provisions of the NPPG. Under this policy, development within coastal change management areas is restricted. Policy CC3 defines a Coastal Change Management Area between Hinkley Point and Steart Point, approximately to the area proposed for compensatory salt marsh and intertidal mud flat creation by the Bristol Port Company.[10]
North Devon and Somerset Shoreline Management Plan Review (SMP2) Hartland Point to Anchor Head (2010)[11]	Non-statutory policy document for coastal defence management planning in the area. These policies have been developed in the light of expected sea level rise due to climate change. The SMP2 includes proposals for the creation of secondary lines of coastal defence between Hinkley Point and Steart Point as part of a policy of managed realignment.

Technical guidance

10.2.3. The technical guidance summarised in **Table 10-3** is relevant to the assessment of the effects on coastal management and marine water quality receptors.

Table 10-3 - Technical guidance relevant to coastal management and water quality

Technical Guidance	Context
Guidelines for Environmental Impact Assessment (EIA) (2017)[12]	Current widely accepted best practice guidelines to undertaking all aspects of EIA.

9 West Somerset Council (2016) *Adopted West Somerset Local Plan to 2032 (*2016). Available online at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton (Accessed August 2024).

10 West Somerset Council (2016). West Somerset Local Plan Policy CC3 – Coastal Change Management Areas. Available online at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton (Accessed August 2024])

11 North Devon and Somerset Coastal Advisory Group (2010). *Shoreline Management Plan SMP2, Hartland Point to Anchor Head*, October 2010. Available online at: https://www.gov.uk/government/publications/shoreline-management-plans-smps/shoreline-management-plans-smps (Accessed August 2024).

12 Institute of Environmental Management and Assessment. (2017). *Guidelines for Environmental Impact Assessment.* IEMA; Lincoln, UK.

Construction Industry Research and Information Association (CIRIA) C532 Control of Water Pollution from Construction Sites[13]	Provides guidance on how to plan and manage construction projects to control water pollution.
Severn Estuary Flood Risk Management Strategy (SEFRMS)[14]	Long-term plan to manage tidal flood risks in the Severn Estuary

10.3 Data gathering methodology

Study area

10.3.1. The Study Area has been defined on a precautionary basis to ensure that, as a minimum, the Zone of Influence (ZoI) (the area around the Works Area that may be affected by the Proposed Works) in respect of the coastal management and water quality impacts has been addressed for the EIA and reported in ES, and to ensure that the ZoI extends to relevant marine ecological features covered during baseline characterisation. This includes consideration of the dynamic physical processes that exist within the vicinity of HPB, including consideration of the extreme tidal conditions.

10.3.2. Whilst water quality effects due to decommissioning are unlikely to extend as far as Watchet or Brean Down or upstream of the tidal section of the River Parrett, to account for the two WFD water bodies potentially directly affected by the Proposed Works, the whole spatial extents of these water bodies are included in the Study Area in relation to water quality. Spring tide ellipses plotted from tidal diamonds on Admiralty Chart 1152 extend for 23 km in an east west direction off Watchet and 23 km in a north-east to south-west direction between Brean Down and Steep Holm, with the main tidal flows running parallel to the southern shore of the Bristol Channel/Severn Estuary. Therefore, for the purposes of the assessment, the Study Area extends up to 23 km in the flood tide direction and 23 km in the ebb tide direction, accounting for effects relating to tidal transport of sediments (and potentially contaminants) mobilised by the Proposed Works.

10.3.3. From a coastal management perspective, the Study Area defined for the water quality assessment is large enough to cover likely effects on coastal processes and is also defined as the Study Area for coastal processes. However, on the basis of the minor nature of the Proposed Works in the marine area, direct effects on coastal processes of removal or repurposing of redundant marine infrastructure are expected to be very localised, so the main focus of the coastal management assessment is the coastline from Lilstock (from the western boundary of 7d29, approximately 5 km to the west of HPB) to Steart Point (to the eastern boundary of 7d35, approximately 7 km to the east of HPB)[11].

10.3.4. In addition to the effects of the Proposed Works in the marine environment, the marine water quality in the Study Area may also be affected by discharges originating from land, including treated sewage and surface water runoff from the Works Area. Influences on, and changes to, water quality arising from discharge of inland surface waters have been taken into account by cross-reference to **Chapter 11: Surface Water and Flood Risk**.

[13] CIRIA (2001). *Control of Water Pollution from Construction Sites*. Available online at: https://www.ciria.org/CIRIA/ProductExcerpts/C532.aspx (Accessed August 2023).

[14] Severn River Basin District Flood Risk Management Plan 2021 to 2027 (2022). Available online at: Severn River Basin District Flood Risk Management Plan 2021 to 2027 (publishing.service.gov.uk) (Accessed August 2024).

Desk study

10.3.5. This assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of data sources which notably include:

- North Devon and Somerset SMP2 Hartland Point to Anchor Head[11];
- Admiralty Charts 1151 (Bridgwater Bay) and 1152 (Bristol Channel Nash Point to Sand Point);
- Environment Agency Flood Risk Management Maps[15];
- Defra Multi-Agency Geographical Information for the Countryside (MAGIC) Website[16];
- Environment Agency Catchment Data Explorer[17]; and
- Information on water quality prepared for the Hinkley Point C (HPC) water discharge activity environmental permit application (2011)[18].

Survey work

10.3.6. Four quarterly marine water quality surveys were taken approximately 800 m offshore from HPB Nuclear Power Station at 51° 13.004' N 3° 08.317' W between May 2021 and February 2022 to support the baseline study for the assessment. The findings of the quarterly surveys are presented in a series of baseline reports, which are summarised in **Section 10.5**.

Data limitations

10.3.7. The following limitations to the baseline data are acknowledged.

- There are no recent data on sediment quality available to assess potential contamination within the Works Area. However, there are data available at a range of sites within 4 km, collected in connection with dredging required as part of construction of the HPC cooling water intake and outfall heads. These data are described in **Section 10.5**.

Overview

10.3.8. The assessment has been informed by consultation responses from statutory engagement, and additional, targeted, technical engagement.

10.4 Consultation

Pre-application opinion

A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the coastal management and water quality assessment and confirmation of how these are addressed by the assessment is included in **Table 10-4.**

15 Environment Agency (2020). Flood Risk Management Maps. Available online at: https://flood-map-for-planning.service.gov.uk/ (Accessed 16 March 2024).
16 Defra (2022). Multi-Agency Geographical information for the Countryside website. Available online at: https://magic.defra.gov.uk/ (Accessed 29 January 2024).
17 Environment Agency (2023). Catchment Data Explorer. Available online at: https://environment.data.gov.uk/catchment-planning/ (Accessed 29 January 2024).
18 EDF Energy (2011) Water Discharge Activity Submission Hinkley Point C. Ref. NNB-OSL-REP-000347.

Table 10-4 - Pre-application opinion responses

Paragraph Ref	Consideration	How addressed in the Environmental Statement (ES)
27	The information used in the proposed EIA scope to determine impacts and assess effects is limited with regards to modelling. Further modelling may therefore be required to investigate transport pathways and accretion, informed by the rate and nature of sediment released into the water column during the various marine infrastructure decommissioning activities.	The assessment of potential effects (presented in **Section 10.10**) in the marine physical environment will draw on existing modelling. Based on the nature and scale of planned works in the marine environment, the existing evidence base is considered sufficient to inform the EIA and additional modelling studies will not be required for the purposes of this EIA. Further details of the Proposed Works in the marine environment are provided in **Chapter 2: The Decommissioning Process** of this ES.
Appendix 2, Table row 4	The proposed methodology does not consider the importance or value of a receptor only its capacity to recover from a hypothetical impact.	Additional detail around receptor 'importance' has been included in this chapter in **Section 10.7**, drawing as appropriate upon Chartered Institute of Ecology and Environmental Management (CIEEM) guidance and ensuring compatibility with the biodiversity assessments.
Appendix 2, Table row 4	It is unclear whether expert judgement will be the basis for assessing significance with respect to water quality and coastal processes, as it is for coastal management.	The assessment of effects on water quality and coastal processes receptors is quantitative where existing standards are available, drawing on relevant datasets but qualitative where necessary through informed professional judgement as set out in this assessment.
Appendix 2, Table row 4	Significant beneficial effects that might occur as a result of the Proposed Works are not defined.	**Table 10-13** sets out the criteria for determining magnitude of change. In this assessment, a beneficial effect may include, for example, improvement of a water

Paragraph Ref	Consideration	How addressed in the Environmental Statement (ES)
		body, based on existing thresholds and criteria.
Appendix 2, Table row 8	There is no reference to a new active effluent discharge outfall in other chapters, or throughout the coastal management and water quality chapter of the scoping report.	Detail with regard to the proposed Active Effluent Discharge Line (AEDL) and the Sewage Treatment Plant (STP) discharge line is presented in **Chapter 2: The Decommissioning Process** and **Chapter 3: Alternatives**. For the purposes of the assessment (presented in **Section 10.10**) and to ensure that it assesses a reasonable worst-case scenario with respect to the scope and extent of works in the marine environment, it is assumed that the AEDL and the STP discharge line will be delivered within the existing CW Outfall Tunnel and extend approximately 220 m beyond the tunnel, along the Outfall Channel. Therefore, the installation of the AEDL and the STP discharge line will require only minimal and highly localised construction activities within the marine environment.
Appendix 2, Table row 9	The hydrodynamic baseline is not defined within the scoping report. The baseline needs to be defined to assess impacts on coastal processes and coastal management, including the baseline with respect to the CW outfall operation. Information on sediment size, and sediment contaminant should be included.	Additional detail on hydrodynamics is included within this chapter in **Section 10.5**. Information on sediment contaminants is included, drawing on information from sampling campaigns monitoring the marine sediments offshore of the Hinkley Point C Site.
Appendix 2, Table row 10	Further information on the arrangements for mitigating accidental releases to the environment is needed to support the decision to scope out effects	Additional detail on embedded environmental measures is included within this chapter (see **Table 10-10**).

Paragraph Ref	Consideration	How addressed in the Environmental Statement (ES)
	on water quality associated with accidental spillage of fuels and oils from the Works Area.	
Appendix 2, Table row 10	ONR notes that there may be potential impacts on the Porlock Bay Oyster farm as a result of accidental spillages. This oyster farm was closed for a few days in August 2021 because of concerns about polychlorinated biphenyl in the water from the Hinkley Point B transformer oil spill.	Potential effects on Porlock Bay Oyster farm have been considered within this chapter. Further detail is provided in **Section 10.10**.

Non-statutory consultation

10.4.1. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

10.4.2. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

10.4.3. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. Comments relevant to the coastal management and water quality assessment are summarised in **Table 10-5.**

Table 10-5 – Comments received during non-statutory consultation relevant to the coastal management and water quality assessment

Respondent	Comment received	Response
Round 1 consultation		
Member of the public	Suggestion of the retention of the liquid nuclear waste discharge route to sea through the main outfall, suggesting that this would require sea water pumping capacity to be retained.	The new AEDL will be installed in order to manage the permitted discharges associated without treatment process plant and facilitate the decommissioning of the existing cooling water system and associated infrastructure. See **Section 10.10.**

Respondent	Comment received	Response
Round 2 consultation – no comments relevant to the coastal management and water quality assessment were received.		

Technical engagement

10.4.4. **Table 10-6** summarises the technical engagement that has been undertaken in relation to the coastal management assessment.

Table 10-6 - Technical engagement undertaken in relation to the coastal management assessment

Stakeholder	Meeting date	Points discussed
Environment Agency	11 July 2024	To provide an overview of the assessment's findings, including the current and future baseline, embedded environmental measures and a summary of the likely effects. Also discussed the Water Framework Directive Appraisal (**Appendix 10B**).
Natural England	18 July 2024	To provide an overview of the assessment's findings, including the current and future baseline, embedded environmental measures and a summary of the likely effects. Also discussed the Water Framework Directive Appraisal (**Appendix 10B**).

10.5 Overall baseline

Current baseline

Location

10.5.1. HPB is located on the coast of the Severn Estuary in Somerset in the south-west of England, approximately 13 km north-west of Bridgwater. The northern boundary fence of the Site extends for 750 m, set back approximately 5 m from the seaward face of a maintained sea wall providing coastal protection.

10.5.2. Marine infrastructure seaward of the sea wall includes a Cooling Water (CW) intake structure comprising a vertical circular intake tower, which extends above the surface sea water level, with a landing stage oriented towards the south-south-east. The intake tower is located at National Grid reference (NGR) ST19264649, 500 m offshore from the face of the sea wall, above the entrance to the intake tunnel. This structure was designed for the abstraction of CW from Bridgwater Bay for use at the Site.

10.5.3. There is also a CW discharge tunnel which extends approximately 220 m from the sea wall to the head of an open discharge channel cut into the rock. This rock channel is approximately 30 m wide and extends for approximately 330 m from the end of the tunnel. Further details are included in **Chapter 2: The Decommissioning Process** of this ES.

10.5.4. There is also an outfall structure extending 8 m from the sea wall at NGR ST21274635, which discharges surface water drainage and formerly discharged various uncontaminated process water streams.

Shoreline management

10.5.5. The North Devon and Somerset SMP2[11] was compiled for the North Devon and Somerset Coast Advisory Group. The area covers the coastline from Hartland Point in the west to Anchor Head at West-Super-Mare in the east. As well as guiding land use and policy in the area, the plan recommends further studies to allow coastal protection measures to be put in place, as required in the future.

10.5.6. In the SMP2, HPB lies immediately to the west of the boundary between policy unit 7d31 (Hinkley Point) and 7d32 (Hinkley Point to Stolford).

10.5.7. For policy unit 7d31, the proposed approach set out in SMP2 is to continue to provide protection of the existing power station, its outfall pipes and landfill sites against flood and erosion, including recognising an option to extend defences by about 1 km westwards if required for development of HPC. Policy to implement the plan (for the short-, medium- and long-term) is to continue to hold the line through maintenance of existing seawall and revetment structures, as well as any new structures required for HPC.

10.5.8. For policy units 7d32 and 7d33, the proposed approach set out in SMP2 is to continue to provide flood protection to the majority of properties and infrastructure, but along a more sustainable and affordable alignment. Policy to implement the plan, is to hold the line in the short-term through maintaining the existing revetment and embankment structures, while detailed investigations are carried out to determine the most appropriate form of any future managed realignment. Medium-term policy is for managed realignment through the construction of set-back defences, as advised by the results of the investigations. In the long-term, policy is to hold the line of the set-back defences.

10.5.9. The West Somerset Local Plan to 2032[9] defines a Coastal Change Management Area between Hinkley Point and Steart Point, approximating to the area proposed for compensatory salt marsh and intertidal mud flat creation by the Bristol Port Company. This is in line with the managed realignment recognised in the SMP2 for policy units 7d34 and 7d35.

10.5.10. These policies will apply irrespective of the Proposed Works.

Baseline flood risk

10.5.11. The Environment Agency Flood Risk Management Maps[19] indicate that the vast majority of the Site and Works Area is within Flood zone 1 with a less than 0.1% probability of flooding from rivers or the sea. The Site is elevated (> 9 m Above Ordnance Datum (AOD)) above the floodplain associated with the adjacent Wick Moor / Outfall Rhyne and is therefore not liable to fluvial or tidal sources of flooding. The area where the existing Sewage Works is located (to the south east of the

[19] Environment Agency (2022). Long Term Flood Risk Mapping for England. Available online at https://flood-warning-information.service.gov.uk/long-term-flood-risk/map (Accessed August 2024).

Site boundary but within the Works Area) lies within Flood Zone 3, which has greater than 1% annual probability of fluvial flooding and / or greater than 0.5% annual probability of sea flooding (**see Chapter 11: Surface Water and Flood Risk**)

10.5.12. The Hinkley Point Power Station coastal sea defence is situated in front of the Site and is a concrete wall. This is graded as having a current condition of 2, which is described as having a Good Condition with minor defects that will not reduce the overall performance of the asset[20]. Information provided by the Environment Agency also indicated a 1 in 1,000 year or 0.1% Annual Exceedance Probability (AEP) Standard of Protection (SOP). The crest height of the defence is 8.34 m AOD, with LiDAR data indicating that the Site is further elevated above the defence to a platform height of approximately 9.2 m -10.0 m AOD. The Environment Agency have provided Product 5 and 6 information for the North Coast Model Tidal which further indicates that the Site is currently protected from tidal flooding for the 0.5% AEP and 0.1% AEP. Under the 1% AEP undefended scenario there are small areas to the north and north-eastern edges of the Site and the Sewage Works within the Works Area indicated to be at flood risk.

10.5.13. The Stolford West coastal sea defence is situated to the east of the Site and is an embankment which was last inspected on 7 August 2024. It was graded as having a current condition of 2, which is described as having a Good Condition with minor defects that will not reduce the overall performance of the asset. The crest height of the defence is 8.19 m AOD[21].

10.5.14. A new sea wall has been constructed along the length of the seafront at HPC, to the west of the Site. The sea defence comprises of a concrete sea wall positioned behind the rock armouring and has a crest height of approximately 13.5 m AOD. Between the sea wall and HPC there are further sections of gabion baskets and gravel landscaping which are positioned at an elevation of 14 m AOD[22].

Coastal management and physical processes

10.5.15. Coastal management at HPB consists solely of maintenance of the sea defences (sea wall), to limit flooding and coastal erosion. Changes in the hydrodynamic regime have the capacity to alter levels or erosion / accretion along the immediately adjacent coastline, thereby affecting coastal management requirements.

10.5.16. As described in the SMP2[11], the intertidal area of Bridgwater Bay consists predominantly of mudflats and is separated from the Site by a low cliff of around 5-10 m in height with policy unit 7d31 being predominantly rock with occasional patches of sand and 7d32 a combination of shingle and mudflats. At low tide the shore adjacent to the Site comprises a narrow rock platform, interspersed with and fringed by mudflats; while to the east, the mudflats extend up to 500 m from the shoreline at low water.

10.5.17. Coastal erosion along the Hinkley Point shore is predominantly of two types: cliff erosion and shore platform down-cutting. Cliff erosion occurs predominantly by undercutting at the cliff base (a wave-

[20] Environment Agency (2013). Practical guidance on determining asset deterioration and the use of condition grade deterioration curves: Revision 1. Available online at: https://assets.publishing.service.gov.uk/media/6034c3b7e90e076607c1bf31/_SC060078_Guidance_Report.pdf (Accessed August 2024).

[21] Environment Agency (2024) Asset Management. (Online). Available at: https://environment.data.gov.uk/asset-management/index.html?element=http%3A%2F%2Fenvironment.data.gov.uk%2Fasset-management%2Fid%2Fasset%2F103072&layer=all-assets (Accessed August 2024)

[22] EDF (2011). Hinkley Point C Development Site Flood Risk Assessment, DCO Application Document Reference 3.2.

cut notch may develop particularly where mudstone is exposed) followed by collapse of the overlying strata. In addition to wave undercutting, it is likely that the cliffs also fail due to excess groundwater pressures just behind their face as well as weathering by rain and frost. A long-term recession rate for the cliff section along the proposed development site has been estimated as approximately 0.13 m/y since 1888[23]. The main high-water mark was estimated to have retreated 0.04 m/y over the same time frame. The rate of cliff erosion may increase in the future as a result of higher sea-levels and enhanced wave attack linked to climate change.

10.5.18. Erosion of the shore platform is caused by subaerial weathering and marine erosion processes, particularly mechanical wave erosion that leads to the detachment of cobble-sized blocks from the platform. During storms these detached pieces are transported by waves to form a shingle beach at the base of the cliffs.

Water quality

WFD water bodies and designated sites

10.5.19. This chapter considers transitional and coastal WFD water bodies. There are no river water or groundwater bodies classified under the WFD that are within the Study Area for coastal management and water quality

10.5.20. The Proposed Works in the marine environment include works to remove the intake structure, situated within the Bridgwater Bay coastal WFD water body (ID: GB670807410000) and Works associated with decommissioning of the former CW outfall and installation of a new AEDL and Sewage Treatment Pipeline (STP), which are situated within the Parrett WFD transitional WFD water body (ID: GB540805210900) (see **Figure 10.1**). Both of these water bodies receive discharges directly from the Site.

10.5.21. Bridgwater Bay water body is at moderate ecological status[24], due to moderate status for biological elements and nitrogen, with all other supporting elements at high status. The Parrett water body is at moderate ecological potential, due to lack of complete implementation of mitigation measures, with other supporting elements at good or high status. Both water bodies fail on chemical status due to mercury and polybrominated diphenyl ether (PBDE) concentrations. Bridgwater Bay water body also fails chemical status due to polycyclic aromatic hydrocarbons (PAH) concentrations.

10.5.22. Both water bodies are afforded further protection under the Habitats Directive (92/43/EEC)[25], as well as by controls on inputs to the Parrett catchment through the Nitrates Directive (91/676/EEC)[26] and the Urban Waste Water Treatment Directive (91/271/EEC)[27]. The Parrett transitional water body also

[23] Hinkley Point C Pre-Application Consultation – Stage 2 Environmental Appraisal Volume 2, Chapter 16: Hydrodynamics and Coastal Geomorphology. Available online at: V2 C16 Hydrodynamics and Coastal Geomorphology.pdf (edfenergy.com) (Accessed August 2024).

[24] Definitions of high, good, moderate and poor status for the various WFD quality elements in England and Wales are detailed in The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015.

[25] European Commission (1992). Directive 92/43/EEC of the European Parliament and of the Council of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora. Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31992L0043&from=EN (Accessed August 2024).

[26] Council Directive of 12 December 1991 concerning the protection of waters against pollution caused by nitrates from agricultural sources (91/676/EEC). Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0676 (Accessed August 2024).

[27] Council Directive of 21 May 1991 concerning urban waste water treatment (91/271/EEC). Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31991L0271 (Accessed January 2024).

includes sites protected under the Bathing Water Directive (2006/7/EC)[28] (see paragraph 10.5.23 for further details).

10.5.23. The Bristol Channel Inner South coastal water body (ID: GB640807670000) to the west and the Severn Lower transitional water body (GB530905415401) to the north east are also within the Study Area defined by the tidal ellipse. Together these water bodies extend along the coast from Minehead to Brean Down and to the tidal limit of the River Parrett. Further detail on these water bodies is provided in **Appendix 10B**. The Study Area includes these water bodies, as well as the Bridgwater Bay and Parrett water bodies.

10.5.24. There are five designated Bathing Waters within the Study Area, at Brean (UK35600) and Berrow North of Unity Farm (UK35500), situated approximately 15 km and 13 km (by sea) northeast of the Works Area, respectively, and at Blue Anchor West (UK35200), Dunster Beach (UK35100) and Minehead Terminus (UK35000), situated between 19.5 km and 24 km west of the Works Area. Current classifications under *The Bathing Water Regulations 2013*[3] are Brean – good, Berrow – good, Blue Anchor – sufficient, Dunster – poor and Minehead – sufficient.

10.5.25. There are no shellfish waters designated under Article 9 of the Water Environment (WFD) (England and Wales) Regulations 2017[1] within the ZoI of coastal zone decommissioning activities at HPB. However, Porlock Bay Oyster farm lies just beyond the western boundary of the Study Area within the Bristol Channel Outer South coastal water body (ID:GB610807680004). The potential effects on this oyster farm have been considered in this assessment. This is in the light of a transformer oil spill incident that occurred at HPB in August 2021 that subsequently caused the temporary closure of the farm due to concerns about polychlorinated biphenyl contamination.

Site-specific monitoring data

10.5.26. As part of the baseline data collation for the EIA, four quarterly water sampling surveys were undertaken approximately 800 m offshore of HPB (see **Figure 10.2**), over the period May 2021 to February 2022 to account for potential seasonal variations. The surveys measured water temperature, salinity, electrical conductivity, dissolved oxygen, nutrients, total metals and total suspended solids. The results are summarised in paragraphs 10.5.27 to 10.5.32 and in **Table 10-7** and **Table 10-8**. Complete results are shown in **Appendix 10A**. Samples were collected at depths of 1 m, 6 m and 11 m from the water surface.

Table 10-7 - Key water quality parameters recorded (depth averaged)

Parameter	Spring (May 2021)	Summer (Aug 2021)	Autumn (Nov 2021)	Winter (February 2022)
Average temperature (°C)	12.5	18.6	12.5	7.8
Salinity (units)	27.7	27.9	27.7	26.2
Electrical conductivity (mS/cm)	32.2	37.9	32.8	27.7

[28] Directive 2006/7/EC of the European Parliament and of the Council of 15 February 2006 concerning the management of bathing water quality and repealing Directive 76/160/EEC. Available online at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32006L0007 (Accessed January 2024).

Parameter	Spring (May 2021)	Summer (Aug 2021)	Autumn (Nov 2021)	Winter (February 2022)
Dissolved oxygen (mg/l)	8.8	7.5	8.9	9.4
Total suspended solids (TSS) (mg/l)	66	159	162	181

10.5.27. In general, considering the monitored parameters, marine water quality is within the expected range for a coastal site. Due to the influence of the River Severn and other freshwater inputs, salinity in the Severn Estuary mostly remains below 30 salinity units, (salinity in the open sea is typically 34 salinity units around the UK), with electrical conductivity of seawater typically around 50 mS/cm.

Nutrients

10.5.28. The focus of site-specific water quality surveys was on levels of nitrogen as nitrate and as ammoniacal nitrogen, both of which are available for uptake by algae and therefore of concern in relation to the potential for changes to the seaweed community, as well as development of nuisance growth of algae (eutrophication). Ammoniacal nitrogen is also a specific pollutant with an Environmental Quality Standard (EQS)[29] established in relation to its toxicity. In water, ammonium ions and un-ionised ammonia exist in an equilibrium, with the latter fraction being the more toxic of the two components, so the EQS for transitional and coastal waters is set at 0.021 mg/l of un-ionised ammonia (expressed as N).

10.5.29. The nutrient results across the survey period were consistently low, at less than the reporting limits for both nitrate and ammoniacal nitrogen (and below the relevant EQS levels) in all cases.

10.5.30. The relationship between the concentration of un-ionised ammonia and the concentration of total ammoniacal nitrogen is influenced by pH, temperature and salinity. For a typical Bristol Channel pH value of 7.9 and using the survey results for temperature (depth averaged) and for salinity, application of the Environment Agency's algorithm for calculation of un-ionised ammonia concentrations shows that the range of total ammonia concentrations observed of 0.20 mg/l to 0.32 mg/l (as N) corresponds to un-ionised ammonia concentrations ranging from 0.0020 mg/l to 0.0057 mg/l (as N), which are of no concern in relation to EQS compliance.

Total metals

10.5.31. The results of the dissolved metal concentrations were all less than the short-term EQS thresholds (maximum allowable concentration - MAC) for lead and nickel. Two reported results exceeded the short-term EQS for mercury (MAC).

10.5.32. Comparison of sample analysis for metals with the associated EQS values, as shown in **Table 10-8,** show that the mean value of the results for each survey was less than the long-term EQS threshold for arsenic (annual average - AA) and nickel (AA) in all cases but exceedances were recorded on a single survey for each of lead (AA), copper (AA) and zinc (AA). For some surveys reporting limits

[29] Ammoniacal nitrogen is of concern both as a form of nitrogen that can contribute to nuisance growths of algae and as a toxic contaminant. EQS are established under the WFD. These are priority substances and certain other polluting chemicals identified in the WFD and Environmental Quality Standards Directive (EQSD)

exceeded the EQS for mercury (AA), lead (AA), cadmium (AA), copper (AA) and zinc (AA), so compliance could not be assessed meaningfully for these sampling occasions.

Table 10-8 - Site-specific trace metal survey results and associated EQS values

Trace metal	Water quality survey results 2021/2022			EQS (µg/l)[30],[31]		
	Mean (µg/l)	Maximum value (µg/l)	Minimum value (µg/l)	Statutory status	AA	MAC
Arsenic	2.58	3.7	2	WFD UK SP	25	-
Lead	<3.2	8	0.8	WFD PS	1.3	14
Cadmium	<0.34	0.8	<0.07	WFD PHS	0.2	-
Mercury	<0.25	<0.3	0.2	WFD PHS	-	0.07
Chromium	<1.8	2.8	0.4	N/A	N/A	N/A
Nickel	<1.2	<2	0.8	WFD UK SP	8.6	34
Copper	<4.5	6	2	WFD UK SP	3.76 (for DOC <1 mg/)l	-
Zinc	<80.75	133	30	WFD UK SP	7.9	-

UK SP: Specific pollutant, with EQS set at national level

PS: Priority Substances - a group of substances shown to be of major concern for European Waters due to their toxicity, bio-accumulating properties and/or persistence in the environment, with EQS set at EU level.

PHS: Priority Hazardous Substances

N/A: No EQS is established in marine waters for total chromium.

Seabed sediment quality

10.5.33. Historically the Severn Estuary has been contaminated by heavy metals from many industries that have now declined. Contamination still remains in the sediments although it is argued that heavy metal concentrations have begun to decline as a result of reduced industrial activity and improved emissions controls[32].

10.5.34. Several sampling campaigns have monitored the marine sediments offshore of the HPC Site. The most recent survey occurred in 2020, consisting of grab and core sampling of areas to be dredged

[30] Environment Agency (2016). Estuaries and coastal waters specific pollutants and environmental quality standards [online]. Available at: https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit (Accessed August 2024).

[31] Environment Agency (2016). Estuaries and coastal waters priority hazardous substances, priority substances and other pollutants environmental quality standards (online). Available at:https://www.gov.uk/guidance/surface-water-pollution-risk-assessment-for-your-environmental-permit (Accessed August 2024).

[32] Sunday, N.U. and Everard, M., (2021). Assessment of Heavy Metals Pollution in Soft Sediment of the Severn Estuary and Inner Bristol Channel System. *British Journal of Environmental Sciences*, *9*(2), pp.1-30.

for construction of HPC. Sampling sites were all within 5 km of HPB. Chemical analysis of the sediment for heavy metals, PAHs, polychlorinated biphenyls (PCBs) and organotins was carried out. The full results are presented in the Cefas BEEMS Technical Report TR536[33].

10.5.35. As TR536 was prepared in relation to dredging, sediment chemical results were compared with Cefas Action Levels[34,35]. Cefas Action Levels indicate the suitability of dredged material for disposal at sea and are used to inform marine disposal license applications. Although not specifically developed as EQS for the maintenance of aquatic life, they nevertheless provide a useful indicator of sediment quality and contamination. Contaminants below Cefas Action Level 1 are of no environmental concern in terms of disposal of dredged material at sea. Those between level 1 and 2 require further consideration, those above level 2 are unsuitable for disposal at sea.

10.5.36. The analysis showed no exceedances of Cefas Action Level 2 and all organotins results were below Action Level 1. No exceedances of Cefas Action Level 2 were measured for metals or PCBs, however there were several results which fell between Cefas Action Level 1 and 2. While above Action Level 1, most results were considerably below Action Level 2. A large proportion of chromium and nickel samples fell between Cefas Action Levels 1 and 2, both at the surface and at depth, suggesting levels are not being driven by recent anthropogenic contamination as deeper sediments represent historic depositions or undisturbed geological material.

10.5.37. Thus, it can be concluded that sediments in the vicinity of HPB are not highly contaminated.

Statutory designations

10.5.38. There are no geological Sites of Special Scientific Interest (SSSIs) within the ZoI of coastal zone decommissioning activities at HPB. The Site is bounded by several sites designated for nature conservation interest, including the Severn Estuary/Môr Hafren Special Area of Conservation (SAC), Special Protection Area (SPA) and Ramsar site and the Bridgwater Bay National Nature Reserve (NNR) and SSSI (see **Figure 10.1**). Specific water quality targets for suspended solids or contaminants have not been set in relation to these sites, so no assessment of significance of changes in water quality in respect of such targets (EQS) can be made. Assessment of significance of effects of changes in coastal processes or water quality on habitats and species for which these sites are recognised is covered in **Chapter 9: Marine Biodiversity** and the **HRA Appraisal**.

Permitted Discharges

10.5.39. There are a number of consents authorising discharges into the marine environment in the vicinity of the HPB Site (although it is noted that some of these are historic in nature, and no longer active). Consents still in force are detailed in **Table 10-9**.

[33] Cefas (2020) Cefas BEEMS Technical Report TR536, Sediment sample chemical and physical analysis results for dredging application - Hinkley Point C. Part 1 - cooling water intakes and outfalls.

[34] MMO (2015). High Level Review of Current UK Action Level Guidance. A report produced for the Marine Management Organisation, pp 73. MMO Project No: 1053. ISBN: 978-1-909452-35-0.

[35] UK action level utilises two chemical action levels (cALs) originally proposed by the Centre for Environment, Fisheries and Aquaculture Science (Cefas) – an Action Level 1(cAL1) and an Action Level 2 (cAL2). Samples below cAL1 are generally considered acceptable for disposal at sea, pending other considerations such as physical suitability for the disposal site and potential beneficial uses. Sediments above cAL2 are considered unacceptable for uncontrolled disposal at sea without special handing and containment.

Table 10-9 - Permitted Discharges within the Study Area and currently valid

Consent Number	Consent/permit title	Description	Discharge Location
EPR/101266	HPB Water Discharge Activities	A1 Discharge of trade effluent consisting of cooling water and regenerate from the water treatment plant	ST 21501 46528
		A2 Discharge of trade effluent consisting of generator transformer oil cooling water, turbine hall drainage, the chilled water system effluent, boiler feed water drainage, reactor cooling water during outages, site drainage and wastewater from the water treatment process	ST 21269 46350
		A3 Discharge of secondary treated sewage effluent	ST 21501 46528
		A4 Discharge of trade effluent consisting of the non-radiological components of the effluent from the radioactive treatment plant	ST 21501 46528
EPR/CB3735DT HPB Radioactive Substances Activities		W1 System provided for discharging radioactive waste from the Final Delay Tanks and Tritiated Water Storage Tanks to the Bristol Channel via the main cooling water outfall	ST 21501 46528
		W2 Systems provided for discharging drainage from the Feed Water Condensate Polishing Plant to the Bristol Channel via the main cooling water outfall	ST 21501 46528
		W3 System provided for discharging sewage plant effluent to the Bristol Channel via the main cooling water outfall	ST 21501 46528
		W4 System provided for discharging boiler water and auxiliary cooling water to the Bristol Channel beach via the Circular Hall drains and Surface Water Drains	ST 21269 46350

Consent Number	Consent/permit title	Description	Discharge Location
		W5 System for discharging plant drains (boiler and turbine hall) to the Bristol Channel beach via the Dirty Drains Pit and Surface Water Drains	ST 21269 46350
EPR/102980	HPA Trade Effluent Permit	Discharge of neutralised water from cooling ponds and chemical treatment processes, decontamination detergent and remediated groundwater.	Severn Estuary at NGR ST 2082 4682, approximately 570 m to the north-west of the Site.
EPR/EB3392VY	HPA Trade Effluent Permit	Discharge of site drainage, turbine hall void water and general services water.	Severn Estuary at NGR ST 20759 46255 approximately 330 m to west of the Site.
EPR/JP3122GM/V003	HPC Trade Effluent Permit	Discharge of site drainage, pumped groundwater and concrete wash water during construction of HPC.	Nine different outlets to the Severn Estuary, Holford Stream, Bum Brook and drainage ditch, all located to the west of the Site boundary.

10.5.40. Relevance to this assessment is as follows:

- Permit EPR/101266: This permit authorises the main CW and trade effluent discharge from the operating HPB power station. While discharge of heated CW from the condensers has already ceased, a reduced flow of abstracted sea water is maintained to assist in conveying remaining trade effluents associated with defueling and other ongoing processes. The discharge of abstracted sea water will cease at an early stage during the Preparations for Quiescence phase of decommissioning. Therefore, the baseline for this ES assumes limited discharges of abstracted sea water, reducing to zero early in the programme. These discharges, including the trade effluents and treated sewage, will continue to be authorised by the existing consents/permits and changes in these discharges are characterised within the baseline and are thus outside the scope of this assessment and associated WFD compliance assessment. The permit will need to be varied to reflect the change in the nature of the infrastructure, with the existing outfalls removed and replaced by an AEDL and a new STP laid together through the existing outfall tunnel and within the existing outfall channel, extending 220 m seaward of the existing outfall discharge location.

- Permit EPR/101266 also authorises treated sewage discharges from the sewage treatment works, which serves both HPA and HPB sites and is located within the HPB decommissioning works boundary to the south of the Site. Discharges are currently made into the Severn Estuary, approximately 200 m north of the Site. Future discharges of treated sewage from HPA and HPB will be discharged via a new STP, laid alongside the new HPB AEDL, which will carry effluents via the existing CW Outfall, to the Severn Estuary.

10.5.41. Where consents or permits are still active, it is assumed that the relevant inputs to the marine environment are captured within the baseline environment characterisation.

Future baseline

10.5.42. Climate change is likely to alter the status and distribution of many local habitats and coastal features in the long-term, for example through changes to the local coastline, and associated hydrodynamics / sediment regimes. The SMP2[11] recognises the need for regular review, noting the policy of holding the line within the sub-cell. In the absence of the Proposed Works, requirements for maintenance of the sea defences, and enhancement as required to accommodate the effects of climate change, will remain and this situation represents the future baseline in relation to coastal management. It should be noted that effects of climate change on flood risk within the terrestrial (land) part of the Works Area are addressed in **Chapter 7: Climate Change** and **Chapter 11: Surface Water and Flood Risk**.

10.5.43. In addition to altering the status and distribution of habitats, climate change has the potential to increase water temperatures. This may affect water quality in the future by accelerating biological processes, and subsequently increasing biochemical oxygen demand, increasing algal growth rate, and altering nutrient balances.

10.5.44. WFD water bodies have a target of Good overall status by 2027 unless reasons of technical infeasibility or disproportionate cost justify a lower target. For the purposes of this assessment, it is assumed that the identified directly affected water bodies will achieve good status by 2027 and beyond that date, in accordance with WFD objectives, until at least the end of the Preparations for Quiescence phase of decommissioning.

10.6 Embedded environmental measures

10.6.1. As part of the design process, a number of embedded environmental and good practice measures are proposed to reduce the potential for impacts on coastal management and marine water quality. **Table 10-10** outlines how these embedded measures will influence the coastal management and marine water quality assessment.

Table 10-10 - Summary of embedded environmental measures

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
Minimising subtidal working Where possible, during works associated with the decommissioning of the cooling water outfall and installation and decommissioning/removal of the AEDL and new STP discharge line, will be carried	Marine licence conditions, Environmental Management Plan (EMP)	Embedded measure

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
out from the shore working 'in the dry' in the intertidal zone using land-based equipment, to minimise sediment mobilisation and facilitate avoidance of disturbance of sensitive intertidal and subtidal features during the Preparations for Quiescence phase.		
Limiting use of anti-fouling materials The use of anti-fouling material may continue to be necessary in areas which will be operational after the initial decommissioning activities, such as the installation of the AEDL and new treated sewage outfall, which are expected to protrude from the end of the existing outfall infrastructure. Use of the anti-fouling materials will be minimised and will not involve use of organo-tin compounds. This measure will help to protect the water quality of the Works Area during all project phases and, in particular, will ensure avoidance of pollution by organo-tin compounds.	Marine licence conditions, EMP	Embedded measure
The use of methods which minimise mobilisation of sediments The intake structure will be removed to the seabed level. There will be no use of explosives. Works relating to the CW outfall, AEDL and new treated sewage outfall will be carried out by land-based plant working above the level of the tide, as far as possible. These approaches will minimise sediment mobilisation arising from works during the Preparations for Quiescence phase.	Marine licence conditions EMP	Embedded measure
Minimising potential for effects of accidental spillages of harmful materials Inventories of harmful materials present at any one time in the marine environment will be minimised, consistent with operational safety requirements. Pollution risk and pollution controls will be managed in accordance with the IMS, which aligns to best practice guidance.	EMP	Embedded measure
Site surface water management measures Measures to ensure control of the quality of surface water discharges from the Works Area are	EMP	Embedded measure

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
described in **Table 11-4** of **Chapter 11: Surface Water and Flood Risk**.		
Ground water management measures Measures to ensure control of the quality of ground water from the Works Area are described in Table 12.7 of Chapter 12: Soils, Geology and Hydrogeology.	EMP	Embedded measure

10.7 Assessment methodology

10.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3**, **Section 5.4**, **Section 5.6**, and **Section 5.7**. However, whilst this has informed the approach that has been used in this chapter, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the assessment of impacts on coastal management and water quality in this ES chapter.

General approach

10.7.2. Current maintenance of the coastal defences is part of the established baseline for HPB and is not considered to be part of the Proposed Works. However, decommissioning works that affect the integrity of existing coastal flood defences (for example, the removal of marine structures which may alter the existing hydrodynamic regime) may have the potential to increase the risk of coastal flooding or erosion of the Site. This aspect has been considered within the coastal management part of the assessment.

10.7.3. The removal of marine infrastructure is generally considered beneficial in terms of restoring the natural coastal regime, so additional mitigation is unlikely to be required for the long-term effects of absence of these structures.

10.7.4. Regardless of the Proposed Works, the SMP2[11] policy for sub-cell 7d31, identifies the need to maintain coastal defences to "*hold the line through maintenance of existing seawall and revetment structures*", which may require strengthening existing coastal defences. The EIADR is based on the assumption that coastal defences will be retained and maintained during decommissioning.

10.7.5. Due to the minimal footprint of marine infrastructure associated with HPB, and the fact that the sea defences are already in place (and will remain in place at the same location during and after decommissioning) and are subject to an agreed management regime under the SMP2[11], it was considered that there was no requirement for significant computational modelling of hydrography, sediment transport, erosion or deposition to inform the assessment of effects on coastal management.

10.7.6. Changes in water quality may also affect other receptors and this is assessed in other relevant chapters of this report (primarily **Chapter 9: Marine Biodiversity** and **Chapter 11: Surface Water and Flood Risk**). However, EQS have been established for many water quality parameters with the aim of protecting the ecological status and use of water bodies and the status of water bodies is

already assessed under the WFD. It is therefore possible to assign significance to effects on water quality by assessing changes in water quality against this overall protection regime for the water environment. Indirect effects on recreational use may also result if water quality changes occur that affect compliance with specific bacteriological EQS set for Bathing Waters.

Determination of significance

10.7.7. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[36] (hereafter referred to as "EIADR") recognises that decommissioning will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identify those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the proposed project*".

10.7.8. The EIADR does not define significance. The significance of an effect resulting from a development is determined in this assessment by reference to the sensitivity (or 'importance') of a receptor and the magnitude of the effect and applying the matrix described in **Chapter 5: Approach to EIA** and repeated here in **Table 10-11** for convenience. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the Proposed Works.

10.7.9. However, assessment of significance based on numerical scales for importance and sensitivity of receptors and magnitude of effects is not appropriate in terms of effects on the coastal management regime and conclusions will be based on expert judgement, informed by consultation with bodies responsible for implementation of the SMP2[11].

10.7.10. As with many aspects of decommissioning, removal of infrastructure has the potential to result in beneficial effects through restoration of a more natural environmental regime. Positive effects, as well as any adverse effects, have been assessed.

[36] UK Government (1999). *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999.* Available online at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

Table 10-11 - Significance evaluation matrix as applied to this assessment

		Magnitude of change				
		Very high	**High**	**Medium**	**Low**	**Very low**
Sensitivity/importance/value	**Very high**	Major (Significant)	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)
	High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
	Medium	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
	Low	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

10.7.11. **Table 10-12** details the basis for assessing the level of importance/value and sensitivity of receptors.

Table 10-12 - Importance/value of receptors

Level of Importance/value	Criteria
Very high	Highly managed coastal areas where erosion, coastal flood defences and land use are highly vulnerable to changes in hydrographic regime. Receiving water body required to maintain specific quality characteristics in addition to those required to support WFD high ecological status in order to support internationally important designated site/feature. Bathing Water Protected Areas currently at 'excellent' standard under *The Bathing Water Regulations 2013* (as amended)[37]. Water bodies with very low capacity to accommodate any change to current water quality status, compared to baseline conditions.

[37] The Bathing Waters (England) Regulations 2013. Available online at: https://www.legislation.gov.uk/uksi/2013/1675/made (Accessed January 2024).

Level of Importance/value	Criteria
High	Highly managed coastal areas where erosion, coastal flood defences and land use are vulnerable to changes in hydrographic regime. Water quality of receptor water body classified under the WFD as supporting high ecological status/potential. Bathing Water Protected Areas currently at 'good' standard under *The Bathing Water Regulations 2013* (as amended)[37]. Shellfish Water Protected Areas[38] that meet all standards applied under the WFD. Water bodies with very low capacity to accommodate any change to current water quality status, compared to baseline conditions.
Medium	Highly managed coastal areas where erosion, coastal flood defences and land use are moderately resilient to changes in hydrographic regime. Water quality of receptor waterbody classified under WFD as supporting good ecological status/potential. Bathing Water Protected Areas currently at 'sufficient' standard under *The Bathing Water Regulations 2013* (as amended)[37]. Shellfish Water Protected Areas where evidence suggests lack of compliance with WFD standards. Receptor has low capacity to accommodate change to water quality status.
Low	Managed coastal areas where erosion, coastal flood defences and land use are highly resilient to changes in hydrographic regime. Water quality of receptor classified under the WFD as supporting moderate ecological status/potential. Baseline conditions define an environment that has a high capacity to accommodate proposed change to water quality status, due for example to large relative size of receiving water feature and effect of dilution.

[38] Shellfish water protected areas are areas designated for the protection of shellfish growth and production.

Level of Importance/value	Criteria
Very low	Unmanaged coastal areas where erosion and coastal flood defences are not of concern and the natural regime protects land use from changes in hydrographic regime. Water quality of receptor water body classified under the WFD as poor or bad ecological status/potential. Poor or bad status water bodies which have severely restricted ecosystems and may be very polluted. Bathing Water Protected Areas currently at 'poor' standard under *The Bathing Water Regulations 2013* (as amended)[37]. Specific water quality conditions of receptor water feature likely to be able to tolerate proposed change with very little or no impact upon the baseline conditions detectable.

10.7.12. **Table 10-13** details the basis for assessing magnitude of change.

Table 10-13 - Establishing the magnitude of change

Magnitude	Criteria
Very high	Changes in the hydrographic regime would compromise effectiveness of flood defences or cause erosion to the extent that major, long-term changes in the existing coastal management regime are required. Changes in water quality result in long-term, permanent deterioration in WFD status and compromise meeting the WFD or bathing water objectives set out in the RBMP.
High	Changes in the hydrographic regime would require minor, long-term changes in the existing coastal management regime. The change is permanently (or over the long-term) significantly out of step with levels of natural variation, resulting in a long-term change in the status of an identified receptor (e.g. status of the receiving WFD or bathing water body).

Magnitude	Criteria
Medium	The changes in the hydrographic regime are sufficient to require local remedial coastal management actions. The change is permanently (or over the long term) out of step with levels of natural variation, resulting in a change in the status of an identified receptor (e.g. status of the receiving WFD or bathing water body).
Low	The changes in the hydrographic regime have minor long-term effects on coastal erosion but do not require significant changes to the existing coastal management regime. Short-term changes are likely to be within the range of natural variability and they are not expected to result in any permanent change in the status of the receiving water body.
Very low	The changes in the hydrographic regime are insufficient to require any changes in the existing coastal management regime. A change in water quality, the level of which is so low, or of such a short period, that it will not compromise compliance with any WFD standards or result in any measurable deterioration in water quality.

10.7.13. As with many aspects of decommissioning, removal of infrastructure has the potential to result in beneficial effects through restoration of a more natural environmental regime. Positive effects, as well as any adverse effects, are assessed.

10.8 Assumptions and limitations

10.8.1. The principal assumptions associated with this chapter are that the Proposed Works will be as described in **Chapter 2: The Decommissioning Process** and, in particular, that explosives will not be used for any demolition activity in the marine environment.

10.8.2. Limitations relating to the baseline data underlying the assessment are identified in **Section 10.3**.

10.8.3. It is assumed that environmental controls will be maintained, so that WFD coastal water bodies currently at Good ecological status and Good overall status, as well as designated bathing waters at Good standard, will continue to maintain their status throughout the decommissioning programme.

10.8.4. The assessment assumes that responsible parties are currently implementing the policy of the SMP2[11] with respect to the coastal sub-cells within the Study Area.

10.9 Scope of the assessment

10.9.1. The Proposed Works related to the marine environment involve the demolition of the CW intake head, decommissioning of the CW outfall, installation, operation and decommissioning/removal of a new AEDL and a new treated sewage outfall.

10.9.2. The effects of termination of generation at HPB in 2022 and associated cessation of major CW abstraction and discharge are outside the scope of the EIADR, so this aspect is not included in the assessment.

10.9.3. The scope of the assessment for coastal management and water quality is consistent with the period over which the Proposed Works would be carried out and covers all three phases of the decommissioning period (see **Chapter 2: The Decommissioning Process**).

Study area

10.9.4. The spatial scope of the assessment covers the area as identified in **Section 10.3** and is therefore not repeated here.

Potential receptors

10.9.5. The following key coastal management and water quality receptors have been identified as relevant to this assessment.

10.9.6. Changes in the coastal hydrodynamic regime and sediment transport processes may lead to effects on activities required to fulfil the SMP2 or on water quality, so require examination. The assessment includes identification of changes in these physical characteristics as a result of the Proposed Works, but significance cannot be assigned to such changes, as it is not possible to determine in isolation whether a change in wave regime, currents or sediment transport is beneficial or adverse and there are no standards against which to assess significance.

10.9.7. Physical characteristics considered in this respect are:

- wave regime;
- water current (mainly tidal) regime;
- sediment transport regime; and
- coastal processes (erosion/deposition).

10.9.8. Effects of changes in these physical characteristics may have an effect on activities required to maintain coastal flood risk management objectives, thus requiring an alteration of the SMP2 in the longer term. Any such effects on the implementation of the SMP2 are assigned a level of significance.

10.9.9. From a water quality perspective, the spatial extent of potential impacts from the Proposed Works are dependent on the tidal regime and the transmission and persistence of the pressure. This is taken into account in the definition of the Study Area. Therefore, the coastal water bodies and designated sites (WFD protected areas) that could potentially be affected by changes in water quality arising from the Proposed Development are:

- Bridgwater Bay coastal WFD water body (ID: GB670807410000);
- River Parrett transitional WFD water body (ID: GB540805210900);
- Severn Estuary SAC, SPA, and Ramsar Site; and

- Bridgwater Bay SSSI and Bridgwater Bay NNR.

10.9.10. Locations of these receptors are shown in **Figure 10.1.**

10.9.11. If any significant adverse effect is predicted within these two WFD water bodies, then additional assessment may be required for the following connecting waterbodies:

- Bristol Channel Inner South coastal water body (ID: GB640807670000); and
- Severn Lower transitional water body (GB530905415401).

10.9.12. In the case of water quality, where EQS have been established to protect the marine environment generally, assessment of significance has been made against these EQS. However, this does not preclude further assessment of effects of changes in water quality on receptors considered in other chapters.

10.9.13. Where a receptor is too distant (outside the Study Area) or no pathway of effect can be identified, it has not been considered in the assessment.

10.9.14. The approach to identifying receptors has taken into account the fact that environmental changes may be considered in one aspect chapter, but the consequent effects may be assessed in other chapters. Changes caused by the Proposed Works considered in this chapter may result in effects on receptors assessed in other chapters. Changes considered in this chapter where potential has been identified to affect receptors considered in other chapters are:

- changes in hydrological or sediment transport regime or water quality may affect biodiversity receptors; such effects are assessed in **Chapter 9: Marine Biodiversity**;
- changes in water quality have the potential to affect recreation at coastal designated Bathing Waters; any such effects are addressed in **Chapter 17: People and Communities**.

10.9.15. Where it has been established, by comparison with relevant EQS, that an effect on water quality is not significant (for example in relation to bathing water quality), this is simply recorded in the linked chapter (in this case **Chapter 17: People and Communities**) with no need to repeat the assessment.

10.9.16. Interaction with other chapters may also occur where changes identified in those chapters may affect the coastline or coastal waters. In respect of this chapter, the following link has been identified:

- effects on inland surface water quality identified in **Chapter 11: Surface Water and Flood Risk** may affect water quality in coastal waters through runoff entering the Severn Estuary/Bristol Channel.

Likely significant effects

10.9.17. The likely significant coastal management and water quality effects that have been taken forward for assessment in this chapter are summarised in **Table 10-14**.

Table 10-14 - Likely changes/significant effects

Phase of works	Receptor	Potential changes/significant effects
Preparations for Quiescence	Wave and current regime* Sediment transport regime* Shoreline processes*	Removal of the intake structure will remove an obstruction to currents and waves that could lead to long-term localised changes in the wave climate, currents (direction and speed) and associated changes in sediment transport capacity. The presence of the new AEDL and treated sewage outfall within the existing outfall channel may result in minor changes in hydrodynamics however these changes will be highly localised. Following the decommissioning/removal of the AEDL at the end of the Preparations for Quiescence phase, the hydrodynamics in this localised area will return to the naturalised hydrodynamic regime. However, overall the changes may lead to long-term changes in coastal processes (erosion deposition regime). These changes in physical processes may have indirect effects on marine biodiversity (see **Chapter 9: Marine Biodiversity**). All of these changes could be considered to represent a return to a natural situation pertaining before the intake and outfall structures were built (subject to climate change considerations). Therefore, additional mitigation is unlikely to be required for the long-term effects of absence of these structures.
	Requirement for coast protection activities	Changes in coastal processes may lead to effects on the coastal management regime required to maintain coastal defences, as set out in the SMP.
	Coastal water quality	Any mobilisation of sediments during dismantling works carried out in the sea will cause a temporary increase in the total

Phase of works	Receptor	Potential changes/significant effects
		suspended solids concentration and turbidity. Any mobilisation of contaminated sediments during dismantling works in the sea may cause a temporary increase in contaminant concentrations in the water column. Any spillage of cement associated chemicals or oil from vessels involved in the works will cause temporary effects on coastal water quality. Any increase in suspended solids or contaminant loads (including radiological components) in surface water runoff from the Site may cause an increase in turbidity or contaminant concentrations in the coastal waters. Discharges via the AEDL will be subject to regulation by the Environment Agency, under a variation to the existing permitted discharges, which will ensure that there are no significant adverse effects. Effects on water quality may impact compliance with WFD objectives for the local coastal water bodies. Effects on water quality may have indirect effects on marine biodiversity both in the water column and through effects of redeposition of sediments on marine benthos (see **Chapter 9: Marine Biodiversity**). Any changes in discharge of treated sewage may have a long-term effect on compliance with bathing water EQS at nearby designated Bathing Waters, with potential for indirect effects on coastal recreation (see **Chapter 17: People and Communities**).
Quiescence phase	Wave and current regime* Sediment transport regime* Coastal processes*	The position reached during preparation for quiescence phase will be maintained.
	Requirement for coast protection activities	Changes in coastal processes may lead to effects on the coastal management regime

Phase of works	Receptor	Potential changes/significant effects
		required to maintain coastal defences, as set out in the SMP.
	Coastal water quality	Any increased contaminant loads (including radiological components) in surface water runoff from the Site may cause an increase in contaminant concentrations in the coastal waters. Effects on water quality may impact compliance with WFD objectives for the local coastal water bodies. Effects on water quality may have indirect effects on marine biodiversity (see **Chapter 9: Marine Biodiversity**). Any changes in discharge of treated sewage may have a long-term effect on compliance with bathing water EQS at nearby designated Bathing Waters, with potential for indirect effects on coastal recreation (see **Chapter 17: People and Communities**).
Final Site Clearance phase	Wave and current regime* Sediment transport regime* Coastal processes*	Position reached during Preparations for Quiescence phase will be maintained.
	Requirement for coast protection activities	Changes in coastal processes may lead to effects on the coastal management regime required to maintain coastal defences, as set out in the SMP.
	Coastal water quality	Any increase in suspended solids or contaminant loads (including radiological components) in surface water runoff from the Site during Final Site Clearance may cause an increase in turbidity or contaminant concentrations in the coastal waters. Non-radioactive discharges via the AEDL will be subject to regulation by the Environment Agency which will ensure that there are no significant adverse effects. Effects on water quality may impact compliance with WFD objectives for the local coastal water bodies.

Phase of works	Receptor	Potential changes/significant effects
		Effects on water quality may have indirect effects on marine biodiversity both in the water column and through effects of redeposition of sediments on marine benthos (see **Chapter 9: Marine biodiversity**). Any changes in discharge of treated sewage may have a long-term effect on compliance with bathing water EQS at nearby designated Bathing Waters, with potential for indirect effects on coastal recreation (see **Chapter 17: People and Communities**).

* - Changes in this receptor are not assessed for significance, as there are no standards against which to make such an assessment. However, such changes may result in effects on receptors considered in other chapters.

10.10 Assessment of effects

10.10.1. Identification of changes and assessment of significance of effects is summarised in **Table 10-15** and commentary on the various sections is provided in paragraphs 10.10.2 to 10.10.35 below.

Wave and current regime

10.10.2. The CW intake structure comprises a vertical circular intake tower, which extends above the surface sea water level, with a landing stage oriented towards the south-south-east.

10.10.3. Removal of the intake structure is expected to alter the existing hydrodynamic regime by reducing shelter from the coastline immediately east of the structure, which may therefore be exposed to larger waves when the wind is from the north-west. Similarly, the intake structure will currently provide some restriction to tidal flows, although this is likely to be minor due to the minimal footprint of the intake.

10.10.4. The intake structure is located 540 m offshore from the face of the sea wall and is approximately 35 m in diameter and located in 1 m water depth below chart datum (CD). The width of the Bristol Channel (the area between HPB and the Welsh coast to the North) at this point is approximately 20 km, with depths up to 25 m below CD.

10.10.5. Therefore, the cross-sectional footprint of the intake with respect to tidal currents (i.e. generally parallel to the shore) and the principal direction of wave propagation is negligible compared with the cross-section of the Bristol Channel, meaning water and sediment is already able to be transported around the infrastructure by tidal flows with only local perturbation.

10.10.6. However, the obstruction to flows and waves caused by the presence of the intake structure is minimal in the context of the tidal flows and wave propagation into the inner Bristol Channel as a whole. Following removal of the intake structure during the Preparations for Quiescence phase, the effects of the Proposed Works on changes to the wave and current regime will be permanent in nature and will persist through subsequent phases of decommissioning.

10.10.7. It should be noted that removal of the intake structure will restore a more natural hydrodynamic regime, which can be regarded as a minor beneficial change. Changes to the overall hydrodynamic regime in the vicinity will therefore be **Very Low** in magnitude and will be highly localised.

10.10.8. The outfall extends approximately 200m from the sea wall to the head of an open discharge channel cut into the rock. The rock channel is approximately 30m wide and extends for approximately 330m from the end of the tunnel. The outfall has no features to be removed that have any significant effect on tidal currents. The hyper tidal regime of the estuary means that the in-channel depth can vary significantly over a 24-hour period.

10.10.9. The installation of the AEDL and new STP discharge line will take place inside the existing CW outfall tunnel and within the existing rock outfall channel extending from the end of the tunnel. Its presence within a channel below seabed level and their small diameter (100-150 mm) mean that effects will be **Very Low** in magnitude, if measurable at all.

10.10.10. Changes to the wave and current regime as a result of the installation of the new AEDL will be temporary. The regime will adjust to wider environmental conditions following the decommissioning and removal of the new AEDL at the end of the Preparations for Quiescence phase.

Sediment transport

10.10.11. As changes to the tidal current and wave regime will be highly localised (due to the nature of the Proposed Works and the intention to work in the dry at low tide as much as possible in relation to the outfall), changes to the overall sediment transport regime in Bridgwater Bay are predicted to be of **Very Low** magnitude. This is relevant to maintenance of the Severn Estuary SAC, SPA and Ramsar Site, as well as the Bridgwater Bay SSSI and the Somerset wetlands NNR (see **Figure 10.1** and **Chapter 9: Marine Biodiversity**).

10.10.12. These changes will be permanent in nature and will persist through subsequent phases of decommissioning.

Shoreline processes

10.10.13. The main features surrounding the Site are mudflats to the north and east. The intertidal mudflats of Bridgwater Bay are separated from the Site by a low cliff, of around 5-10 m in height. At low tide the shore adjacent to the Site comprises a narrow rock platform, interspersed with and fringed by mudflats; while to the east, the mudflats extend up to 500 m from the shoreline at low water. Bridgwater Bay forms part of the Severn Estuary.

10.10.14. The Site is protected by a seawall and revetment structures. The shoreline management plan for this section of coastline is to continue to provide protection for the existing power station and maintain existing defences. There is also provision to extend defences 1km westwards of HPC if required to avoid adverse impacts.

10.10.15. Due to the minimal footprint of marine infrastructure associated with HPB, and the fact that the sea defences are already in place and are subject to an agreed management regime under the SMP2[11]. It is considered that localised changes in current velocity and increase in wave heights along this limited section of coast are therefore not expected to result in any measurable changes in coastal erosion or sediment deposition.

10.10.16. Thus, changes in shoreline processes are predicted to be **Very Low** in magnitude.

10.10.17. These changes will be permanent in nature and will persist through subsequent phases of decommissioning.

Coastal management

10.10.18. Current maintenance of the coastal defences is part of the established baseline for HPB and is not considered to be part of the Proposed Works, although decommissioning works that affect the integrity of existing coastal flood defences (for example, the removal of marine structures which may alter the existing hydrodynamic regime) may have the potential to increase the risk of coastal flooding or erosion of the Site.

10.10.19. Coastal management to comply with the SMP2 is a receptor classed as of medium importance/value, as the coastal defences are moderately resilient to changes in the hydrographic regime.

10.10.20. Coastal management at HPB consists of maintenance of the sea defences to limit flooding and coastal erosion. The management regime is the only coastal management receptor considered in this chapter.

10.10.21. The footprint of marine infrastructure to be removed is minimal and considered to be beneficial in terms of restoring the natural coastal regime, so mitigation is unlikely to be required (subject to an agreed management regime under the SMP2).

10.10.22. There is no requirement for significant computational modelling of sediment transport, erosion or deposition to inform the assessment of effects of coastal management.

10.10.23. The changes in hydrodynamic regime will be minimal and highly localised within a section of coast already defended from erosion by a sea wall.

10.10.24. No additional coastal defence works will be required as a result of the Proposed Works, so this effect of **Very Low** magnitude acting upon a receptor of **Medium** importance/value will result in a conclusion that effects are negligible and **Not Significant.**

10.10.25. Although requirements for coastal management activity may need to change over the long-term in order to address issues such as climate change, the absence of any significant effect on these requirements arising from the Proposed Works will continue to be the case throughout the whole decommissioning process.

Coastal water quality

Preparations for Quiescence phase

10.10.26. The CW system will be drained before it is sealed (where the tunnel crosses the sea wall) and left in-situ and open seaward of that point. Draining down of the outfall will only involve water already being discharged once the flow has been transferred to the AEDL. The magnitude of this effect will be of **Very Low** magnitude acting upon a receptor of **Low** importance/value (relevant WFD transitional water bodies at moderate status), resulting in a **Negligible** effect (**Not Significant**). Thus, compliance with WFD requirements (no deterioration and no compromise to the achievement of future objectives in relation to the coastal water bodies) will not be affected (see **Appendix 10B**).

10.10.27. As noted in **Section 10.5**, marine sediments in the vicinity of the Works Area show limited contamination, so any significant mobilisation could result in adverse effects on water quality with potential indirect effects on marine ecological features. High levels of sediment mobilisation may also lead to smothering of biota where the sediment is redeposited (see **Chapter 9: Marine Biodiversity**). At the intake structure, demolition will only extend down to seabed level, with buried infrastructure left *in situ*, and will be undertaken from pontoons using breakers and excavators to break up the structure and assist the collection of waste from the seabed.

10.10.28. Decommissioning of the outfall will involve minimal works in the intertidal area and no works in the subtidal area. Installation and removal of the AEDL and STP discharge line will take place within the outfall channel, which is scoured by the discharge flow at low water so contains little sediment. Works in the intertidal area will be undertaken using land-based equipment allowing precise route selection in accordance with procedures included in the EMP to minimise sediment disturbance and damage to valued biota.

10.10.29. In this way, deterioration of water quality caused by mobilisation of sediment will be largely avoided by using working procedures that will not mobilise any appreciable amount of sediment, as detailed in **Table 10-10**. Any unavoidable sediment mobilisation will be temporary in nature. On this basis, the magnitude of potential effect will be **Very Low**. The receptors are WFD water bodies at moderate status (Bridgwater Bay and Parrett), thus of **Low** importance/value, resulting in a **Negligible** effect (**Not Significant**). Thus, compliance with WFD requirements (no deterioration and no compromise to the achievement of future objectives in relation to the coastal water bodies) will not be affected.

10.10.30. Discharges via the AEDL, comprising discharges that are covered under the existing environmental permit (which will require amendment to reflect the changed discharge location), will be subject to ongoing regulation by Environment Agency under The Environmental Permitting (England and Wales) Regulations 2016[6], which will ensure no significant adverse environmental effect on compliance with water quality objectives in the receiving transitional water body. The discharge will be further out to sea reaching low water mark, in contrast to the present situation where the regulated discharge takes place within the intertidal area. The magnitude of this effect on water quality will be beneficial but **Very Low** in magnitude acting on a WFD water body at moderate status (**Low** importance/value), resulting in **Negligible** (**Not Significant**). effects on water quality EQS compliance.

10.10.31. Discharges of treated sewage from the Site currently enter the sea through the CW outfall. To facilitate CW decommissioning, discharges of treated sewage from the sewage treatment plant will be routed from the Sea Wall to Severn Estuary, via the new STP discharge line, through the CW Outfall tunnel. As the number of personnel on site is not expected to increase, sewage discharges will be at most be maintained and may reduce. Thus, there will be no potential for adverse effect on bacterial levels at any nearby designated bathing waters or at any commercial shellfish activities (the nearest being the Porlock Bay Oyster Farm ~30km west of the Works). Discharge of the flow further down the outfall channel and the reduction in treated sewage flows will result in a reduction in the contribution to bacterial concentrations in the receiving water at nearby designated bathing waters.

10.10.32. However, this is a small, treated sewage discharge into a large, energetic water body, thus the beneficial effects on compliance with microbiological EQS at the nearest bathing water protected area (13 km away) will be **Very Low** in magnitude. Taking account of the **High** importance/value of

these receptors (as the nearest are currently classed as having good quality), effects on compliance with the requirements of the *Bathing Water Regulations 2013*[3] are considered to be **Minor** (**Not Significant**).

All decommissioning phases

10.10.33. **Chapter 11: Surface Water and Flood Risk** has established that, with application of agreed mitigation measures, there will be no significant change in contaminant levels (including radiological components) in surface water runoff from the Site that could lead to an adverse effect on the relevant coastal water bodies (as described within **Section 10.5**). This will apply throughout, including periods when works are taking place during the Preparations for Quiescence and Final Site Clearance phases.

10.10.34. Strict procedures will be set out in the EMP and implemented during all phases of decommissioning, requiring appropriate storage, bunding, use and management of harmful substances to minimise risks of spills of spills of fuel, oils or chemicals. Inventories of harmful materials present at any one time in the marine environment will be minimised, consistent with operational safety requirements (for example vessels and plant carrying adequate fuel). A spill response plan will be included in the EMP and implemented immediately in the event of a spillage on vessels or plant involved in the marine Works or on the Site.

10.10.35. Thus, the magnitude of potential effect will be **Very Low** acting upon receptors of **Low** importance/value, resulting in **Negligible** effects (**Not Significant**). Thus, compliance with WFD requirements (no deterioration and no compromise to the achievement of future objectives in relation to the coastal water bodies) will not be affected.

10.11 Summary

10.11.1. The results of the assessment of effects of the Proposed Works on coastal management and water quality are summarised in **Table 10-15**.

Table 10-15 - Summary of assessment of effects

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
Wave and current regime All phases	Removal of the HPB intake structure would be expected to reduce shelter of the coastline immediately inshore of the structure, which may therefore be exposed to larger waves when the wind is from the north-west. Similarly, the intake structure provides some restrictions to tidal flows which will be removed.	N/a	Very low	N/a	Due to the minimal footprint of the intake structure (35 m diameter in water depth of 1 m below CD) and the small proportion of the cross-section of the Bristol Channel (20 km wide and up to 25 m deep below CD) occupied by this structure, changes to the overall hydrodynamic regime in the vicinity will be very low in magnitude and effects of increased wave impingement on the shore and changes in currents will be highly localised.
Sediment transport All phases	The absence of the intake infrastructure could change the sediment transport regime in the surrounded area.	N/a	Very low	N/a	As changes to the tidal current and wave regime will be highly localised and very small, changes to the overall sediment transport regime in the Bristol Channel are predicted to be very low.
Shoreline processes All phases	Removal of the intake infrastructure could cause changes in levels of erosion along the shoreline.	N/a	Very low	N/a	Due to the minimal footprint of marine infrastructure associated with HPB, and the fact that the sea defences are already in place in the form of a sea wall and are subject to an agreed management regime under the SMP2. It is considered that localised increases changes in current velocity and increase in wave heights along this limited section of coast are therefore not expected to result in any measurable changes in coastal erosion or sediment deposition.
North Devon and Somerset Shoreline Management Plan Review (SMP2) Hartland Point to Anchor Head (2010) All phases	Any works that would compromise existing flood defence levels or lead to an increase in coastal erosion could result in a need to change actions in relation to the SMP.	Medium	Very low	Negligible (Not significant)	None of the works proposed will involve a need to dismantle or compromise or lower the crest level of any existing coastal defences. Also, the changes in hydrodynamic regime will be minimal and highly localised within a section of coast already defended from erosion by a seawall. Therefore, there will be no significant effects on coastal management required to comply with

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
					the SMP2 or any need to revise the plan due to the Proposed Works.
Water quality Preparations for Quiescence	Drainage of water from the existing outfall could affect the receiving water.	Low	Very low	Negligible (Not significant)	The water to be drained down will comprise only water currently being discharged from the outfall so there will be no effect.
Water quality Preparations for Quiescence	Coastal water quality could be affected by suspended sediment mobilised during marine works, with potential indirect adverse effects on marine biodiversity (addressed in **Chapter 9: Marine Biodiversity** and the **HRA Appraisal**).	Low	Very low	Negligible (Not significant)	To avoid mobilisation of contaminated sediments and consequent effects on water quality, the intake structure will be removed to seabed level and tunnels left in situ below the seabed. The HPB CW intake structure will be dismantled without use of explosives. The new AEDL and STP discharge line will be installed and removed within the existing outfall channel which contains little sediment due to the scouring effects of discharges. Any effects on water quality due to minor unavoidable sediment mobilisation will be temporary and minimal.
Water quality All phases	Coastal water quality could be affected by spillages of fuel, oil or other chemicals from vessels involved in the Works or on the Site.	Low	Very low	Negligible (Not significant)	The EMP will set out strict procedures requiring appropriate storage, bunding, use and management of harmful substances to minimise risks of spills of spills of fuel, oils or chemicals. Inventories of harmful materials present at any one time in the marine environment will be minimised, consistent with operational safety requirements. A spill response plan will be included in the EMP and implemented immediately in the event of a spillage on vessels or plant involved in the marine Works or on the Site.
Water quality All phases	Water quality could be affected by sediment laden or contaminated runoff (including radiological contaminants	Low	Very low	Negligible (Not significant)	**Chapter 11: Surface Water and Flood Risk** has established that there will be no significant change in contaminant levels (including

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
	being released in surface water runoff from the Site				radiological components) in surface water runoff from the Site that could lead to an adverse effect on the relevant coastal water bodies.
Water quality All phases	Water quality could be affected by permitted discharges via the AEDL	Low	Very low	Negligible (Not significant)	Discharges via the AEDL are likely to be covered under existing permits, which will continue to be subject to ongoing regulation by the Environment Agency, ensuring no significant adverse environmental effect on the coastal water bodies.
Water quality All phases	Changes in discharge of treated sewage could affect EQS compliance at Bathing Waters	High	Very low	Minor (Not significant)	Discharge location is expected to be further to seaward and sewage flows will be reduced compared with the current situation. Therefore, the Proposed Works will not compromise maintenance of the existing good or sufficient status at relevant Bathing Waters.

10.12 Assessment of cumulative effects

Inter-project effects

10.12.1. There is the potential for coastal management and water quality effects associated with the Proposed Works to interact with or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

10.12.2. An assessment of inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-project effects

10.12.3. A summary of the potential intra-project effects is provided in **Chapter 21: Cumulative Effects Assessment**.

11

Surface water and flood risk

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11 Surface water and flood risk

11.1 Introduction

11.1.1. This chapter describes the scope of the surface water and flood risk assessment. It describes the key considerations with regards to the Proposed Works within the Indicative Dismantling Works Area (hereafter referred to as 'the Works Area') at Hinkley Point B (HPB) nuclear power station. The chapter should be read in conjunction with the project description presented in **Chapter 2: The Decommissioning Process** as well as other topic chapters including **Chapter 9: Marine Biodiversity**, **Chapter 10: Coastal Management and Water Quality and Chapter 12: Soils, Geology and Hydrogeology**, where potential effects associated with the Proposed Works on the marine environment, and onshore groundwater environment have also been considered.

11.1.2. This chapter is supported by the following figures provided in **Volume II** of this ES:

- **Figure 11.1 Surface water and flood risk for planning (Environment Agency);** and
- **Figure 11.2 Risk of surface water flooding (Environment Agency)**.

11.1.3. This chapter is also supported by **Appendix 11A Flood Risk Assessment** (FRA), which can be found in **Volume III**

11.2 Relevant legislation, policy and technical guidance

Legislation

11.2.1. The legislation in **Table 11-1** is relevant to the assessment of the effects on surface water and flood risk receptors:

Table 11-1 - Legislation relevant to surface water and flood risk

Legislation	Legislation issue
2000/60/EC Water Framework Directive (WFD)[1]	The WFD is transposed into law in England and Wales by The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. It sets out the requirement to classify water bodies according to their ecological and chemical status and sets targets for the prevention of deterioration and improvement of their status.
Priority Substances Directive (2008/105/EC)[2]	The directive sets environmental quality standards for priority substances and eight other pollutants. These substances include the metals cadmium, lead, mercury and nickel, and their compounds; benzene; polyaromatic hydrocarbons (PAH); and several pesticides.

[1] Water Framework Directive (2000). (online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32000L0060 (Accessed August 2024).
[2] Priority Substances Directive (2008/105/EC) (2008). (online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0105 (Accessed August 2024).

Legislation	Legislation issue
The Flood and Water Management Act 2010[3]	The Flood and Water Management Act 2010 requires flood and coastal erosion risk management authorities (that did not previously have such a duty) to aim to make a contribution towards the achievement of sustainable development when exercising their flood and coastal erosion risk management functions.
The Environmental Permitting (England and Wales) Regulations 2016[4]	These regulations set requirements for the permitting of discharges to controlled waters and flood risk activities for main rivers.
Land Drainage Act 1991[5]	The Land Drainage Act sets requirements for issuing land drainage consents for ordinary watercourses.
Water Resources Act 1991[6] **(as amended by Water Act 2003**[7]**)**	The Water Resources Act is an Act of Parliament that regulates water resources, water quality and pollution, and flood defence, providing the general structure for the management of water resources. The Water Act amended the Water Resources Act , improving long-term water resource management by: creating two new forms of abstraction licence; and regulating new abstraction and irrigation rights.
Environment Act 1995[8]	The Environment Act sets out sets requirements for abstraction licensing.
Water Resources (Abstraction and Impounding) Regulations 2006[9]	Water Resources (Abstraction and Impounding) Regulations set out provisions relating to the abstraction and impounding of water in the light of amendments made to the Water Resources Act by the Water Act .

[3] UK Government (2010). Flood and Water Management Act (online). Available at: http://www.legislation.gov.uk/ukpga/2010/29/contents (Accessed August 2024).
[4] UK Government (2016). The Environmental Permitting (England and Wales) Regulations (online). Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents (Accessed August 2024).
[5] UK Government (1991). Land Drainage Act (online). Available at: https://www.legislation.gov.uk/ukpga/1991/59/contents (Accessed August 2024)
[6] UK Government (1991). Water Resources Act (online). Available at: https://www.legislation.gov.uk/ukpga/1991/57/contents (Accessed August 2024)
[7] UK Government (2003). Water Act (online). Available at: https://www.legislation.gov.uk/ukpga/2003/37/contents (Accessed August 2024).
[8] UK Government (1995). Environment Act (online). Available at: https://www.legislation.gov.uk/ukpga/1995/25/contents (Accessed August 2024).
[9] UK Government (2006). The Water Resources (Abstraction and Impounding) Regulations (online). Available at: https://www.legislation.gov.uk/uksi/2006/641/contents/made (Accessed August 2024).

Legislation	Legislation issue
Environment Act 2021[10]	The Environment Act 2021 sets out requirements for the Secretary of State to set long term targets for key environmental priority areas, including water. It places an obligation on water companies to reduce the adverse impacts of storm overflows on water quality.

Policy

11.2.2. A summary of the relevant policies is given in **Table 11-2**. Regarding local planning policy, HPB was previously under the jurisdiction of Somerset West and Taunton Council which, in April 2023, was one of five councils that were merged into a new unitary authority called Somerset Council. Therefore, where local policy has not been superseded with new local policy from Somerset Council, local policy from Somerset West and Taunton Council is referred to. Whilst planning policies, including local policy and the National Planning Policy Framework (NPPF), do not contain specific policies for applications relating to nuclear decommissioning which are determined by the Office for Nuclear Regulation (ONR), they are material considerations.

Table 11-2 - Policy relevant to surface water and flood risk

Policy reference	Policy relevance
National policy	
National Planning Policy Framework (NPPF) (2023)[11]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works and assessment of surface water and flood risk. In relation to flood risk, the NPPF identifies requirements for addressing flood risk for new developments, steering more vulnerable development into areas of lower flood risk and outlines the following Flood Risk Assessment (FRA) requirements for proposed development within each Flood Zone: ▪ Flood Zone 1: On sites comprising one hectare or above, the vulnerability to flooding from sources, and the potential to increase flood risk elsewhere should be incorporated into an FRA; and ▪ Flood Zones 2 and 3: All development proposals in this zone should be accompanied by an FRA. The NPPF states that FRAs are required consider and mitigate as appropriate flood risks from all sources, both to the Proposed Works and to external receptors arising from the Proposed Works. The FRA should also

[10] UK Government (2021). Environment Act (online). Available at: https://www.legislation.gov.uk/ukpga/2021/30/contents (Accessed August 2024).

[11] Department for Levelling Up, Housing and Communities (2023). Revised National Planning Policy Framework (online). Available at: https://www.gov.uk/government/collections/revised-national-planning-policy-framework (Accessed August 2024).

Policy reference	Policy relevance
	consider the potential effects of climate change over the lifetime of the Proposed Works. The NPPF directs development away from areas at highest risk of flooding via the application of the Sequential Test. If following application of the Sequential Test it is not possible for the project to be located in zones with a lower probability of flooding; the Exception Test can be applied if appropriate. For further details, see the FRA provided in **Appendix 11A.**
Local policy	
Somerset Waste Core Strategy Development Plan Document up to 2028 (2013)[12]	Policy DM7 sets out that development proposals will need to demonstrate that surface water quality has been given sufficient consideration, and that there will not be impacts on the flow regime and flood risk. It also states that an FRA will be required where the proposals within an existing flood risk area or where they could lead to flood risk elsewhere.
Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) (2020)[13]	Policy 5.7, The Natural and Historic Environment states that proposals should protect and enhance water quality, and minimise water use from development through the use of Sustainable Drainage Systems (SuDS) and ensuring that it is supported by adequate sewage treatment facilities and surface water drainage. As stated in **Chapter 4: Policy and Legislation Overview**, Somerset West and Taunton Council (SWT) are no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council.
Adopted West Somerset Local Plan to 2032 (2016)[14]	Policy CC2, Flood Risk Management states that development proposals should be located so as to mitigate against, and to avoid increased flood risk elsewhere, in accordance with the flood risk management provisions set out in the NPPF. Development must be designed to mitigate any adverse flooding impact, and where possible should help contribute towards a reduction of existing flood risk. Policy CC6 Water Management states that development that would have an adverse impact on (amongst other things) the availability and use of existing water resources and on areas at risk of flooding by tidal, fluvial and surface water runoff will only be permitted if suitable protection and mitigation measures can be delivered both on-site and through displacement to adjoining land.
North Devon and Somerset Shoreline	This is a non-statutory policy document for coastal defence management planning within sub cells 7d30, 7d31 and 7d32. It includes proposals for: • holding the line at Hinkley Point (7d31) in the short, medium and long term (to 2105);

[12] Somerset County (2013). Council Waste Core Strategy Development Plan Document up to 2028 (online). Available at: https://www.somerset.gov.uk/waste-planning-and-land/somerset-waste-core-strategy/ (Accessed August 2024)
[13] Somerset West and Taunton (2020). Local Plan review 2040 (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/somerset-local-plan/somerset-west-and-taunton-local-plan-2040-review/ (Accessed August 2024)
[14] West Somerset Council (2016). West Somerset Local Plan to 2032 (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton (Accessed August 2024).

Policy reference	Policy relevance
Management Plan (SMP2) (2010)[15]	▪ no active intervention west of Hinkley Point between Lilstock and Hinkley Point (7d30); and ▪ the creation of secondary lines of coastal defence between Hinkley Point and Stolford (7d32) as part of a policy of managed realignment in the medium term (2025 to 2055).

Technical guidance

11.2.3. A summary of the relevant policies is given in **Table 11-3**.

Table 11-3 - Technical guidance relevant to surface water and flood risk

Technical guidance	Context
CIRIA C741 Environmental good practice on site (2015)[16]	Provides a practical guide setting out a range of mitigation strategies for managing environmental impacts from site work upon receptors including the water environment.
CIRIA C532 Control of water pollution from construction sites (2001)[17]	Provides guidance on how to plan and manage construction projects to control water pollution.
Planning practice guidance: flood risk and coastal change (2022)[18]	The Planning Practice Guidance (PPG) has been published alongside the NPPF to set out how certain policies, including those relating to flood risk, should be implemented. The PPG for floodrisk and coastal change makes use of the concepts of flood zones, vulnerability classifications and compatibility to assess the suitability of a specific site for a certain type of development. It also provides guidance on what is meant by a "design flood" and the concept of "residual risk".
Flood Risk Assessments: Climate change allowances (2022)[19]	Guidance for developers and their agents preparing FRAs for applications. It sets out climate change allowances for predicting changes in peak river flow, rainfall intensity, sea level risk and offshore wind speed and extreme wave height. This includes allowances for different climate scenarios over

[15] North Devon and Somerset Coastal North Devon and Somerset Coastal Advisory Group (N Advisory Group (NDASCAG) (2010). North Devon and Somerset Shoreline Management Plan (SMP2) (online). Available at: http://southwest.coastalmonitoring.org/wp-content/uploads/NDASCAG_SMP2/Statement_Environmental_Particulars.pdf (Accessed August 2024).

[16] Construction Industry Research and Information Association (CIRIA) (2015). C741 Environmental Good Practice on Site (online). Available at: https://www.thenbs.com/PublicationIndex/documents/details?Pub=CIRIA&DocID=309502 (Accessed August 2024).

[17] Construction Industry Research and Information Association (CIRIA) (2001). C532 Control of Water Pollution from Construction Sites (online). Available at: https://www.ciria.org/ProductExcerpts/C532.aspx (Accessed August 2024).

[18] Ministry of Housing, Communities and Local Government (2024). Planning Practice Guidance (online). Available at: https://www.gov.uk/government/collections/planning-practice-guidance (Accessed August 2024).

[19] Environment Agency (2022). Guidance on Flood Risk Assessments: Climate Change Allowances (Online). Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances (Accessed August 2024)

Technical guidance	Context
	different epochs. HPB is situated within the South and West Somerset management catchment.
Sustainable Drainage Systems: non statutory technical standards (2015)[20]	Contains non-statutory technical standards for the design, maintenance and operation of SuDS, for the attenuation and infiltration of surface water on-site.
The CIRIA SuDS manual (2015)[21]	Provides guidance on the planning, design, construction and maintenance of SuDS in order to deliver key objectives of managing flood risk and water quality on-site.
Guidance on flood risk activities: environmental permits (2022)[22]	The guidance sets out the requirements for environmental permitting for proposals on or near main rivers. The guidance sets out that for proposals on ordinary watercourses (i.e. small rivers, streams, and ditches), the local council or Internal Drainage Board (IDB) should be contacted for land drainage consent.
Guidance on applying for consent to work on an ordinary watercourse (2022)[23]	The guidance notes that it is a legal requirement to seek consent from the relevant authority for works on an ordinary watercourse, whether permanent or temporary. This may also include repairs to certain existing structures and maintenance works. It states that if the works are within an IDB area then the IDB must be contacted. The Somerset Drainage Boards Consortium have provided a map which identifies the Works Area and Study Area as being within the district of the Parrett IDB.
Guidance on Land Drainage Consents (2022)[24]	Identifies a range of works that would require land drainage consent for ordinary watercourses within the Somerset Drainage Boards' districts (including that of the Parrett IDB). The IDB has Land Drainage Byelaws, which require consent for activities in, over, under or within 9 m of arterial watercourses within the district that are designated as 'IDB-maintained'.

[20] DEFRA (2015). Sustainable drainage systems: non-statutory technical standards (Online) Available at: https://www.gov.uk/government/publications/sustainable-drainage-systems-non-statutory-technical-standards (Accessed August 2024)

[21] CIRIA (2015). The SuDS Manual (Online) Available at: https://www.ciria.org/CIRIA/CIRIA/Item_Detail.aspx?iProductCode=C753 (Accessed August 2024)

[22] Environment Agency (2022), Flood Risk Activities: Environmental Permits (Online) Available at: https://www.gov.uk/guidance/flood-risk-activities-environmental-permits (Accessed August 2024)

[23] Somerset County Council (2022). Guidance on applying for consent to work on an ordinary watercourse (Online). Available at: https://www.somerset.gov.uk/waste-planning-and-land/apply-for-consent-to-work-on-an-ordinary-watercourse/#Downloads (Accessed August 2024)

[24] Somerset Drainage Boards (2022). Consortium Development Control and Byelaws on Land Drainage Consents (Online) Available at: https://somersetdrainageboards.gov.uk/development-control-byelaws/land-drainage-consents/(Accessed August 2024)

11.3 Data gathering methodology

Study Area

11.3.1. The Works Area, which, apart from the existing Sewage Treatment Plant (STP), is situated within the HPB Nuclear Site Licence (NSL) boundary ('the Site'). The STP lies to the south of the Site (see **Figure 11.1**).

11.3.2. The surface water Study Area covers the onshore surface water catchment area of the Site and the adjacent and downstream extent of drainage ditches, the sea defences and other water infrastructure. The upstream extent of the Study Area is delineated by the Wick Moor Drove Road on the basis that any features beyond this (including Hinkley Point C (HPC) Nuclear Power Station) will have no hydrological connection to the Works Area. The seaward boundary of the Study Area is defined as the Mean High Water Springs (MHWS) mark. Below MHWS, impacts on coastal processes and tidal waters receptors are considered in **Chapter 9: Marine Biodiversity** and **Chapter 10: Coastal Management and Water Quality**.

Desk study

11.3.3. This assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process** and is supported by a number of data sources. The principal data sources used to inform this chapter comprise of the following:

- OS 1:10K and 1: 25K Ordnance Survey (OS) mapping;
- Somerset Drainage Boards Consortium mapping[25];
- Environment Agency Catchment Data Explorer[26];
- Environment Agency Long Term Flood Risk Map for England[27];
- Environment Agency Flood Map for Planning (FMfP)[28];
- Open data for Flood Zone 2 and 3[29];
- Environment Agency Flood Reconnaissance Information System (FRIS)[30];
- British Geological Survey (BGS) Maps Portal[31];
- Met Office UKCP18 derived projections and climate risk indicators[32];

[25] Somerset Drainage Boards Consortium (2022). Axe Brue, Parrett, North Somerset Levels IDBs (Online). Available at: https://sdbc.maps.arcgis.com/apps/View/index.html?appid=013d8b18f2c7434e92a0802f5ffd541c (Accessed 16 April 2024)

[26] Environment Agency (2022). Catchment Data Explorer (online). Available at: https://environment.data.gov.uk/catchment-planning/ (Accessed August 2024).

[27] Environment Agency (2022). Long Term Flood Risk Mapping for England (online). Available at: https://flood-warning-information.service.gov.uk/long-term-flood-risk/map(Accessed August 2024).

[28] Environment Agency (2022). Flood Map for Planning (online). Available at: https://flood-map-for-planning.service.gov.uk/ (Accessed August 2024)

[29] Government Digital Service (2022) Open Data under the Open Government License v3.0 (Online). Available at: https://data.gov.uk/ (Accessed August 2024)

[30] Environment Agency (2001). South West Region Flood Reconnaissance Information System database

[31] British Geological Survey (BGS) (2022). Geoindex (onshore) (online). Available at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/(Accessed August 2024).

[32] Met Office (2022). United Kingdom Climate Projections (UKCP18) (online). Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index (Accessed August 2024).

- Centre of Ecology and Hydrology (CEH) Flood Estimation Handbook (FEH) web service[33];
- Defra MAGIC Website[34];
- Somerset County Council Preliminary Flood Risk Assessment (PFRA)[35]; and
- West Somerset Catchment Flood Management Plan (CFMP)[36].

Survey work

11.3.4. A site walkover was carried out on 10 to 11 August 2021 to characterise the baseline surface water environment within the Works Area and Study Area. Up-to-date satellite imagery (Google Maps) and discussion with the Applicant has been used to confirm that the presence / absence of surface water features and flood defences has not changed significantly since that time.

Data limitations

11.3.5. The assessment of flood risk in this chapter and the supporting FRA (provided within **Volume III, Appendix 11A**) draws heavily on flood modelling for the HPB site carried out in 2012 as part of the Japanese Earthquake Flood Response (JER) study.[37] This modelling did not account for sub-surface drainage infrastructure. The starting assumption was that during extreme events, the debris load in surface water runoff increases significantly, resulting in increased blockage potential, reducing the effectiveness of the drainage system. However, the JER work recognised that the existing HPB drainage infrastructure will provide some drainage function, and flood alleviation even in very extreme events. As such this represents a source of conservatism as part of flood studies for the site.

11.3.6. There is no up-to-date, site-specific tidal, fluvial or pluvial modelling available for HPB to the year 2120 with climate change allowances applicable to the Proposed Works. Therefore, the JER flood study and available Environment Agency mapping are used as proxy data to represent the future scenarios required. This is discussed in detail in the FRA (**Appendix 11A**).

11.4 Consultation

Overview

11.4.1. In their roles as Risk Management Authorities, the Environment Agency and Somerset Council as Lead Local Flood Authority (LLFA) are statutory consultees in the planning process.

[33] Centre of Ecology and Hydrology (UKCEH) (2022). Flood Estimation Handbook (Online) Available at: https://fehweb.ceh.ac.uk/ (Accessed August 2024)
[34] DEFRA (2022). Magic Designated Sites Mapping (online). Available at: https://magic.defra.gov.uk/ ((Accessed August 2024)
[35] Somerset County Council (2011). Preliminary Flood Risk Assessment Report (PFRA). Available at: https://www.somerset.gov.uk/beaches-ports-and-flooding/lead-local-flood-authority/ (Accessed August 2024)
[36] Environment Agency (2012) West Somerset Catchment Flood Management Plan (CFMP). (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/294040/West_Somerset_Catchment_Flood_Management_Plan.pdf (Accessed August 2024).
[37] Royal Haskoning / AMEC (2012), EDF Energy, Japanese Earthquake Response Flood Modelling, Flood Summary Report Hinkley Point B.

11.4.2. An initial technical engagement meeting was held with Somerset County Council (SCC) (as it was then) on the 11 July 2021 to discuss the methodologies for the walkover survey, which was subsequently carried out on 10 to 11 August 2021. Following the meeting, SCC noted that they were in agreement with the proposals for the walkover which covered the extents of the Study Area. The rhynes identified in the area are all classified as ordinary watercourses under the jurisdiction of the Parrett Internal Drainage Board. In a letter dated 11 March 2022, SCC also confirmed that they did not hold any flood risk or drainage information for HPB and the surrounding area.

Pre-application Opinion

11.4.3. A Pre-application Opinion was adopted by the ONR, on 07 December 2022. A response was received from the Environment Agency on 11 November 2022, but no reference was made to the surface water and flood risk chapter. Similarly, no comments were received at that time from (as was then) Somerset County Council in their role as Lead Local Flood Authority.

Non-statutory consultation

11.4.4. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

11.4.5. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

11.4.6. Responses to both the first and second rounds of non-statutory consultation are presented in the **Consultation Feedback Report**. Comments relevant to the surface water assessment are summarised in **Table 11-4.**

Table 11-4 Comments received during non-statutory consultation relevant to the surface water assessment

Respondent	Comment received	Response
Round 1 consultation		
No comments were received during the Round 1 consultation relevant to the surface water assessment.		
Round 2 consultation		
Somerset Council	Suggestion that pollution control for surface water must be considered for both the removal and construction of buildings before it enters the drainage network.	The decommissioning work on-site will follow good industry practices. In addition, the appointed contractors will be required to adhere to pollution prevention measures, secured via the **Environmental Management Plan**.

Technical engagement

11.4.7. In response to various data requests between 2022 and 2024, the Environment Agency provided information on present day flood risk, flood defences and discharge / abstraction licences for the HPB area. This included:

- North Coast Tidal Model (product 5 and 6 data);
- Asset Information Management System (AIMS) data in the vicinity of HPB, including a map of flood defence locations and tabulated data including defence type, dimensions and condition; and
- Reference to available online data (utilised as listed in paragraph 11.3.3 above);

11.4.8. For further details regarding present day flood risk and flood defences, further detail of which is provided within the FRA provided **Appendix 11A**.

11.4.9. In addition, copies of permits from the Environment Agency and Wessex Water were obtained. Relevant information is summarised in **Table 11-5** below.

Table 11-5 - HPB water permit information

Consent Number	Consent/permit title	Description	Discharge Location
EPR/101266	HPB Water Discharge Activities	A1 Discharge of trade effluent consisting of cooling water and regenerate from the water treatment plant	ST 21501 46528
		A2 Discharge of trade effluent consisting of generator transformer oil cooling water, turbine hall drainage, the chilled water system effluent, boiler feed water drainage, reactor cooling water during outages, site drainage and wastewater from the water treatment process	ST 21269 46350
		A3 Discharge of secondary treated sewage effluent	ST 21501 46528
		A4 Discharge of trade effluent consisting of the non-radiological components of the effluent from the radioactive treatment plant	ST 21501 46528
EPR/CB3735DT HPB Radioactive Substances Activities		W4 System provided for discharging boiler water and auxiliary cooling water to the Bristol Channel beach via the Circular Hall drains and Surface Water Drains	ST 21269 46350

11.4.10. A technical engagement meeting was held with the Environment Agency on 11 July 2024. Discussion focused on seeking agreement assumptions used in the flood risk assessment, and the scope of the surface water and flood risk assessment.

11.4.11. A technical engagement meeting was also held with the Somerset Drainage Boards' Consortium on 21 August 2024, in which the Proposed Works, potential impacts and mitigation were outlined and opportunities for comments and questions provided.

11.5 Overall baseline

Current baseline

Topography

11.5.1. The topography within the Works Area varies with an average of approximately 10 metres above Ordnance Datum (mAOD), ranging from a maximum elevation of 17 metres AOD within the western part of the Works Area to a minimum elevation of between 4 mAOD to 5 mAOD in the southern extent of the Works Area, where the STP is located. The Works Area is approximately 22.7 ha in size.

11.5.2. Within the Study Area, levels gradually slope from west to the east and north – east from a high of approximately 20 mAOD near Pixies Mound to the west of the Works Area towards the MHWS level at Hinkley Brake and the Great Arch outfalls. Pixies Mound is west of the Works Area, within the NSL boundary, but outside of the Works Area.

Surface water features and water quality

11.5.3. The Works Area is located across two operational catchments as defined in the South West River Basin Management Plan (RBMP). The west of the Works Area is within the Somerset West Streams Operational Catchment and the east of the Works Area is within the Parrett Operational Catchment. However, the Study Area is not within any river waterbody that is reported in the RBMP[38] under the WFD. However, there are coastal and transitional WFD water bodies which are considered separately within **Appendix 10B Strategic Water Framework Directive Assessment.**

11.5.4. There are a series of ditches, locally known as ‘rhynes’, to the south and east of the Works Area, as shown on **Figure 1-.1**. These rhynes are ordinary watercourses, which are located in the operational area of the Parrett IDB. In addition, the Somerset Drainage Boards’ online mapping shows that several of the larger rhynes are designated as ‘IDB-maintained’, meaning that the IDB controls water levels within them via the operation of a number of control structures and outfalls, and carries out regular maintenance work to ensure drainage is maintained for agricultural purposes.[39] There are no surface water features flowing through the Works Area, however, there is a drain that flows along the southern boundary of the Site.

11.5.5. The main surface water features within the Study Area that may be affected by the Proposed Works are summarised in **Table 11-6** and their locations are shown in **Figure 11.1**.

[38] Environment Agency (2024). Catchment Data Explorer, Parrett Operational Catchment (online). Available at: https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3353 (Accessed August 2024)

[39] Somerset Drainage Boards Consortium (2024). Axe Brue, Parrett and North Somerset Levels Internal Drainage Boards Map. Available at: https://sdbc.maps.arcgis.com/apps/View/index.html?appid=013d8b18f2c7434e92a0802f5ffd541c (Accessed August 2024).

Table 11-6 - Surface Water features

Water Feature Type	Water Feature Name	Description
Ordinary Watercourse	Wick Moor/Outfall Rhyne	Flows partly along the eastern boundary of the Site boundary. Wick Moor/Outfall Rhyne flows in a north-easterly direction for 450 m before discharging into the Severn Estuary at Hinkley Brake via an outfall which is identified as an Environment Agency asset (ST 21774 46106). Classified as 'IDB-maintained'.
	Hinkley Point Rhyne	A rhyne flowing for 485 m around the high ground surrounding the STP to Coal Lane Sluice. Classified as 'IDB-maintained'.
	Coal Lane Sluice	A tilting weir linking Hinkley Point Rhyne and Wick Moor/Outfall Rhyne. Classified as an 'IDB structure.'
	Sharpham/Coal Lane Sluice Rhyne	A rhyne flowing for 800 m between Wick Moor/Outfall and West Brook. Classified as 'IDB-maintained'.
	West Brook	A rhyne flowing for 1600 m, discharging into the Severn Estuary at Great Arch Outfall. Classified as 'IDB-maintained'.
Site of special scientific interest (SSSI)	Bridgwater Bay	Bridgwater Bay SSSI is located directly north of the Works Area in which current surface water from the Works Area discharges to. Its main habitat is littoral sediment.
Special protection area (SPA), Special area of conservation (SAC) and Ramsar	Severn Estuary	The SPA, SAC and Ramsar site boundary is located directly adjacent to the northern Works Area boundary (i.e. above MHWS). The surface water from the Works Area outfalls to the Severn Estuary within these designated areas.

11.5.6. There are a number of existing abstraction and discharge locations associated with HPB, however, these are situated within tidal offshore waters and therefore are not part of the Study Area in this surface water and flood risk assessment (as there are no onshore abstractions). Permits relevant to the surface water and flood risk assessment are listed in

11.5.7. Further baseline information relating to land quality and hydrogeology are included in **Chapter 12: Soils, Geology and Hydrogeology**.

Existing surface water drainage

11.5.8. Within the Works Area, the existing surface water sewers receive storm water from the main building, car parks and other minor buildings and roads which form HPB.

11.5.9. Drainage arising from plant sources is conveyed to the drain pit where it is pumped to the surface water drainage system via an oil interceptor.

11.5.10. The surface water drainage system is kept separate from the cooling water arisings which are both then discharged to the tidal waters of the Severn Estuary at separate locations via permit EPR101266, together with other effluents as outlined in **Table 11-5.** The cooling water is discharged into the Severn Estuary at an outfall located at ST 2150 4650 and the surface water drainage at ST 2127 4635. No details of capacity of the surface water drainage are known, but, as it was constructed in the late 1960s, it is a reasonable assumption that water would not flood the ground during a 1 in 2 to a 1 in 5 year pluvial event.

11.5.11. Foul drainage for the Works Area is collected via a separate piped system and treated at the STP which is located to the south-east of the NLS boundary (and hence lies outside of the NLS boundary but is included within the Works Area). Effluent is then carried back round the eastern side of the Works Area and out to the Severn Estuary to the north via permit EPR101266 discharging at ST 2150 4653, where it is monitored in line with permit conditions.

Existing flood defences

11.5.12. In the North Devon and Somerset SMP2[15] the coastline is split into cells. HPB lies immediately to the west of the boundary between sub-cells 7d31 (Hinkley Point) and 7d32 (Hinkley Point to Stolford). For the coastline at HPB the plan is to continue to provide protection to the existing power station against flood and erosion for the short, medium and long term, with managed realignment by the creation of secondary lines of coastal defence in the medium term (2025 to 2055) to the east of the Works Area.

11.5.13. Information from the Environment Agency's Asset Information Management System (AIMS)[40] has been used to develop an understanding of the current status of flood defences in the vicinity of the Works Area. There are two main coastal flood defences currently protecting the Works Area, both maintained by the Applicant. A 1040 m long concrete sea wall lies along the northern Works Area boundary of both HPB and HPA, with an effective crest level of 8.34 mAOD (AIMS ID 103072). This is approximately equivalent to ground levels immediately behind the defence. East of this lies a 137 m long embankment with rock armour with an effective crest level of 8.67 mAOD (ID 104524). Beyond the Works Area boundary to the west, there is a new 1261 m long defence (provided for the HPC power station), which has a 1 in 10,000 year standard of protection and is set at 13.50 mAOD.

11.5.14. To the east of the Works Area boundary lies a 715 m long rock revetment and sea wall (ID 4842) at 8.19 mAOD and beyond that a 639m long embankment with rock armour (ID 102490) at 8.23 mAOD; these provide protection of the Works Area and the wider Site from flooding along its eastern and southern boundaries. The Wick Moor Outfall and West Brook rhynes discharge through the embankments east of the Works Area via tidal flap-valves as discussed above.

11.5.15. Not recorded in the AIMS is a gabion basket wall, reaching up to approximately 12 mAOD, running along most of the estuary frontage of HPB and HPA, behind the sea wall and set back from it. The JER report[37] states that the strength of the gabion wall is questionable. Therefore, the JER study modelled the breaching of this defence in extreme tidal flood events.

[40] Environment Agency (2024), AIMS Spatial Flood Defences (inc. standardised attributes). Available at: https://www.data.gov.uk/dataset/cc76738e-fc17-49f9-a216-977c61858dda/aims-spatial-flood-defences-inc-standardised-attributes (Accessed August 2024)

Present day flood risk

Historic flood outlines

11.5.16. The Environment Agency's historical flood outline and Historic Flood Map is provided in the FRA (**Volume III, Appendix 11A)**. It shows that there have been no recorded floods within the Works Area, however the most southern part of the Works Area, where the existing STP is located, is within the recorded flood outline.

Fluvial and tidal flood risk

11.5.17. The Environment Agency's Flood Map for Planning (FMfP) shows the risk of fluvial or tidal flooding in accordance with the Flood Zones. Flood Zones are based on the probability of fluvial or tidal flooding occurring and are as follows:

- Flood Zone 1 – Land having a less than 0.1% Annual Exceedance Probability (AEP) of river or sea flooding.
- Flood Zone 2 – Land having between a 1% AEP and 0.1% AEP of river flooding; or land having between a 0.5% AEP and 0.1% AEP of sea flooding.
- Flood Zone 3a – Land having a 1% AEP or greater annual probability of river flooding; or Land having a 0.5% AEP or greater probability of sea flooding.
- Flood Zone 3b – This zone comprises land where water from rivers or the sea has to flow or be stored in times of flood. This land will have a 3.3% AEP or greater probability of flooding, with any existing flood risk management infrastructure operating effectively or land that is designed to flood.

11.5.18. A review of the FMfP (see **Figure 11.2**) indicates that the majority of HPB is predominantly located in Flood Zone 1. The exception is the STP and surroundings which are in Flood Zone 3. Access to the Works Area is from the south-west corner via Wick Moor Drove. Part of this route (outside of the Site or Works Area) lies within Flood Zone 3.

11.5.19. The Environment Agency Risk of Flooding from Rivers and Sea map is similar to the FMfP but also shows areas that may flood during a 3.33% AEP event, which would be classified as 'functional floodplain'. These areas all lie outside of the Site and Works Area which provides confirmation that parts of the Works Area that are within Flood Zone 3 would be sub-classified as Flood Zone 3a.

11.5.20. The JER flood report indicates that tidal flood risk is the dominant influence in the vicinity of HPB and fluvial flood extents are heavily influenced by the downstream tidal boundary conditions. Further information and a full explanation of the JER tidal modelling is provided in the FRA in **Appendix 11A**.

Surface water flood risk

11.5.21. A review of the Environment Agency's Risk of Flooding from Surface Water (RoFSW) mapping uses the following categories:

- Very Low Risk: - land that has a less than 0.1% AEP of flooding;
- Low Risk: - land that has between a 1% AEP and 0.1% AEP of flooding;
- Medium Risk: - land that has between a 3.33% AEP and 1% AEP of flooding; and
- High Risk: - land that has greater than a 3.33% AEP of flooding.

11.5.22. The RoFSW indicates that several areas within the Works Area are at High, Medium and Low Risk of surface water flooding.

11.5.23. The High Risk areas are small in extent and are found on roads within HPB at depths predominantly up to between 0 and 0.15 m.

11.5.24. Medium risk areas are centred around the access routes within the Works Area, comprising two small depressions in the central eastern side of the Works Area and some small, confined areas in the southern extent of the Works Area at depths of predominantly between 0.15 m and 0.3 m. These include areas adjacent to the reactor building.

11.5.25. Low Risk areas are found in similar areas to the Medium Risk areas with slightly smaller extents, predominantly at depths up to 0.15 m, but with some depths reaching up to between 0.3 m to 0.6 m e.g. along the centre of the road north of the reactor building.

11.5.26. It should be noted that the Environment Agency surface water mapping includes a 12mm/hr loss to represent drainage. It is considered that this provides a reasonable representation of loss to drainage at HPB.

11.5.27. The majority of the Works Area is impermeable (consisting of existing buildings, roads and areas of hard-standing), and relatively flat. This reduces the amount of infiltration that would otherwise naturally occur to almost nothing.

11.5.28. More detailed information including the RoFSW mapping and plan of the site drainage system can be found in the FRA in **Appendix 11A**.

Groundwater flood risk

11.5.29. The Environment Agency Flood Risk Indicators and the West Somerset and Exmoor Strategic Flood Risk Assessment[41] indicate no identified groundwater flood risk at HPB. Further information on geological and hydrological conditions are presented in **Chapter 12: Soils, geology and hydrogeology**.

Artificial sources of flood risk

11.5.30. A review of the Environment Agency's Reservoir Flood Extent Mapping, which can be seen in the FRA in **Appendix 11A** indicates that HPB is not at risk of flooding from potential failure of reservoirs located upstream of the Study Area. Also, no artificial water features such as canals lie within the Study Area.

Future baseline

11.5.31. HPA is located directly west of the Works Area at a level approximately 1 m higher than HPB. The decommissioning works at HPA are unlikely to impact HPB due to the difference in level.

11.5.32. A range of existing studies have been utilised for HPB to help predict the future baseline for all sources of flood risk. This includes site specific hydraulic modelling taken from the JER[37] studies and current Environment Agency guidance[19] on sea level rise and increase rainfall to consider the full lifespan of the Proposed Works (up to approximately 2120). For a full review of future flood risk

[41] West Somerset Council & Exmoor National Park Authority (2009). Strategic Flood Risk Assessment. (Online). Available at: Microsoft Word - 090324 ENPA WSC SFRA Level 1 Final Report with changes.doc (exmoor-nationalpark.gov.uk)

allowances and reasonings behind the data used to represent future flood risk to the Works Area, please refer to the FRA provided in **Appendix 11A**.

11.5.33. A detailed description of future flood risk at the Works Area can be seen in the FRA in **Appendix 11A**. A summary is presented below.

Fluvial and tidal flood risk

11.5.34. Fluvial and tidal flood risk, both on and off-site, are likely to increase up to 2120 (when the Proposed Works will have been completed by) as a result of climate change. There are no anticipated increases in flood risk as a result of the proposed works. The Site will continue to be protected from tidal flooding, with maintenance to the primary concrete sea-wall flood defences continuing until 2120 and the ground levels providing a natural defence. It is assumed that the gabion wall will reach the end of its design life before this time.

11.5.35. The embankment to the east of the Works Area will be retained in the medium term (to 2055), although realigned, and will provide protection to the access road for this period. In the long term (to 2120) the tidal flood risk to the access road may increase if this defence is no longer in place or deteriorates.

Surface water flood risk

11.5.36. Surface water flooding is likely to increase across the Works Area as the severity and frequency of rainfall events is likely to increase. While the surface water drainage system will continue to serve the Works Area, it may become overwhelmed earlier during extreme events.

Groundwater flood risk

11.5.37. Groundwater flood risk to the Works Area may increase due to future increase in total rainfall; further information on geological and hydrological conditions are presented in **Chapter 12: Soils, Geology and Hydrogeology**.

Artificial sources of flood risk

11.5.38. The Works Area will continue to be outside of the current reservoir extent, which will not change in the future.

11.6 Embedded environmental measures

11.6.1. A range of environmental measures have been identified for the Proposed Works to manage the potential for effects on surface water, flood risk and other inter-related effects (e.g. for the coastal management and water quality, and geology and hydrogeology aspects). **Table 11-7** presents the relevant embedded measures which have been taken into account for the assessment of effects.

Table 11-7 - Summary of Embedded Environmental Measures

Embedded measure	Compliance mechanism
Coastal protection and flood risk adaptation measures As set out in Section 11.5 (within the current and future baseline assessments), the existing coastal flood defences are currently designed to protect the operational HPB power station, and they will continue to protect the Works Area during the Proposed Works (taking into account current climate change allowances). A range of organisations have an interest in the management of the coastline in the vicinity of HPB. These include: ■ Hinkley Point Site Licensees : The existing coastal flood defences are currently designed to protect the operational HPB power station, and they will continue to protect the Site during the Proposed Works (taking into account current climate change allowances). Relevant sea defences will be maintained as appropriate (currently managed by EDF and NRS for HPB/HPC and HPA respectively). ■ The Environment Agency has responsibility for maintaining tidal flood defences to the east of HPB. The North Devon and Somerset Shoreline Management Plan includes proposals for the creation of secondary lines of coastal defence between Hinkley Point and Stolford as part of a policy of managed realignment	**Environmental Management Plan, Nuclear Site Safety Case**
Emergency Flood Response Plan An Emergency Flood Response Plan will be prepared to ensure that appointed contractors understand the procedures in the event of potential or actual flooding in the event of either extreme surface water or tidal flooding to the Works Area.	**Site Emergency Plan**
Site water management measures Surface runoff will be managed within the Works Area, with turbid water from the demolition zone collected and treated appropriately. This will include settlement prior to discharge to the existing site drainage system, or potentially off-site disposal depending on contamination levels. Wheel washes will be used to avoid silt loads being spread away from the Works Area by vehicles. Measures will consider changes to the Works Area drainage inputs due to the Proposed Works, such as changes to water quality / quantity / contaminants, and potential for silty runoff / contaminated runoff / leaching from stockpiled materials. The potential for dewatering to be required will also be considered in advance of excavation work, and if dewatering is anticipated to be needed, a dewatering assessment will be carried out in advance to identify suitable environmental measures to minimise the potential for contaminant mobilisation and to protect the water environment and ensure compliance with water environment legislation. No non-consented discharge is anticipated to be discharged into the rhynes to the south and east of the site, all water will be discharged to the Severn Estuary.	**Environmental Management Plan**

Embedded measure	Compliance mechanism
Good industry pollution prevention practices Pollution risk and pollution controls will be managed in accordance with the IMS, which aligns to best practice guidance.	**Integrated Management Strategy**
Proposed design of buildings The proposed Decommissioning Waste Processing Facility (DWPF) and Operational Waste Processing Facility (OWPF) will be built above the highest predicted flood level for all sources of flood risk or designed to be flood-resilient to this level. The proposed Safestore building will be constructed to resist external floodwaters from entering the building, meaning it will not be at risk from flooding.	**Nuclear Site Safety Case** The building design requirements for external flood protection and flood-resilience will be incorporated into the Nuclear Site Safety Case.

11.7 Assessment methodology

11.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: The EIA process**. However, whilst this has informed the approach that has been used in this chapter, further detail is provided to set out how this methodology has been applied, and adapted, to address the specific needs of the surface water and flood risk assessment.

Determination of significance

11.7.2. The basis for the evaluation of the significance of effects used in this assessment for surface water and flood risk receptors is the change in risks from baseline conditions to the risks which are applicable to the Proposed Works and the related site conditions.

11.7.3. The EIADR recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The process identifies those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the development*".

11.7.4. The significance of an effect resulting from a development during decommissioning is most commonly assessed by reference to the sensitivity of a receptor and the magnitude of change acting upon it. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by a development. The assessment also references appropriate embedded environmental measures and assumes that they will be successfully implemented as part of the works.

11.7.5. Sensitivity is assessed on a scale of high, medium, low and very low, whilst magnitude is assessed on a scale of high, medium, low and negligible. The criteria for defining sensitivity and magnitude can be found in **Table 11-8** and **Table 11-9**, along with example applications. These criteria are defined and applied based on professional judgement and are based upon good practice for surface water and flood risk assessment. **Table 11-8** details the basis for assessing receptor sensitivity.

Table 11-8 - Establishing the sensitivity of receptors

Sensitivity	Criteria	Receptor type	Examples
High	Features with a high yield, quality or rarity with little potential for substitution.	Aquatic environment	Conditions supporting sites with international conservation designation (SAC, SPA, Ramsar site) where the designation is based specifically on aquatic features. WFD water bodies at High Ecological Status/ Potential.
High	Features with a high vulnerability to flooding.	Flood risk	Land use type defined as 'Essential Infrastructure' (i.e., critical national infrastructure, such as essential transport and utility infrastructure) and 'Highly Vulnerable Use' (e.g., police/ambulance stations that are required to operate during flooding, mobile homes intended for permanent residential use) in the NPPF flood risk and land use vulnerability classification.
Medium	Features with a medium yield, quality or rarity, with a limited potential for substitution.	Aquatic environment	Conditions supporting a site with a national conservation designation (e.g. SSSI, National Nature Reserve (NNR)), where the designation is based specifically on aquatic features. WFD water bodies at Good Ecological Status/Potential.
Medium	Features with a medium vulnerability to flooding.	Flood risk	Land use type defined as 'More Vulnerable Use' in the NPPF flood risk and land use vulnerability classification (e.g., most types of residential development, hostels and hotels, landfill, and waste management facilities).
Low	Features with a low yield, quality or rarity, with some potential for substitution.	Aquatic environment	Conditions supporting a site with a local conservation designation (e.g., Local Nature Reserve (LNR), where the designation is based specifically on aquatic features, or an undesignated but highly/moderately water-dependent ecosystem, including a Local Wildlife Site (LWS). WFD water bodies at Moderate Ecological Status/ Potential or lower.
Low	Features with a low vulnerability to flooding.	Flood risk	Land use type defined as 'Less Vulnerable uses' in the NPPF flood risk and land use vulnerability classification (e.g., most types of business premises).
Very Low	Commonplace features with very low yield or	Aquatic environment	Small, ordinary watercourses located outside of reportable WFD waterbodies

Sensitivity	Criteria	Receptor type	Examples
	quality with good potential for substitution.		
Very Low	Features that are resilient to flooding.	Flood risk	Land use type defined as 'Water-compatible use' in the NPPF flood risk and land use vulnerability classification and undeveloped land (e.g., flood control infrastructure; water transmission infrastructure).

11.7.6. The basis for assessing magnitude of change is provided in **Table 11-9**.

Table 11-9 - Establishing the magnitude of change

Magnitude	Criteria	Receptor type	Examples
High	Results in complete loss or major change to feature, of sufficient magnitude to affect its use/integrity.	Aquatic environment	Deterioration in flow regime, morphology or water quality, leading to sustained, permanent or long-term breach of relevant conservation objectives (CO) or environmental quality standards (EQS). Non-temporary downgrading (deterioration) of WFD surface water body status (including downgrading of individual WFD elements) or resulting in the inability of the coastal water body to attain Good status by the relevant deadline in line with the measures identified in the River Basin Management Plan (RBMP).
		Flood risk	Change in flood risk resulting in potential loss of life or major damage to the property or infrastructure.
Medium	Results in partial loss or noticeable change to feature, of sufficient magnitude to affect its use/integrity in some circumstances.	Aquatic environment	Deterioration in flow regime, morphology or water quality, leading to periodic, short-term and reversible breaches of relevant COs or EQSs. Potential temporary downgrading of water body status (including potential temporary downgrading of individual WFD elements), although not affecting the ability of the surface water body to achieve future WFD objectives.
		Flood risk	Change in flood risk resulting in potential for moderate damage to the property or infrastructure.
Low	Results in minor change to feature, with insufficient magnitude to affect its use/integrity in most circumstances.	Aquatic environment	Measurable effect on flow regime, morphology or water quality, but remaining generally within CO and EQS. No short-term or permanent change to WFD surface water body status (of overall status or element status).
		Flood risk	Change in flood risk resulting in potential for minor damage to property or infrastructure.

Magnitude	Criteria	Receptor type	Examples
Very Low	Results in little or no change to feature, with insufficient magnitude to affect its use/integrity.	Aquatic environment	No measurable effect on river flow regime, morphology or water quality, and no consequences in terms of CO, EQS or surface water body status.
		Flood risk	Increased frequency of flood flows, but which does not pose an increased risk to property or infrastructure.

11.7.7. For the assessment of effects for each identified receptor, the sensitivity value presented in **Table 11-8** has been combined with the magnitude of change taken from **Table 11-9** to determine an overall significance rating based on the evaluation matrix shown in **Table 11-10.**

Table 11-10 - Significance of effect

		Magnitude of change			
		High	**Medium**	**Low**	**Very Low**
Sensitivity	**High**	Major (Significant)	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)
	Medium	Major (Significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
	Low	**Moderate (Potentially Significant)**	Minor (Not Significant)	Negligible (Not significant)	Negligible (Not significant)
	Very Low	Minor (Not Significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

11.8 Assumptions and limitations

11.8.1. There are uncertainties associated with the available data to assess flood risk and environmental issues and therefore the conclusions based upon this data. Further details related to the assumptions and limitations can be seen in **Section 11.3**.

11.9 Scope of the assessment

Study Area

11.9.1. The surface water Study Area covers the onshore surface water catchment area of the Works Area and the adjacent and downstream extent of drainage ditches, the sea defences and other water infrastructure (see **Figure 11.1**). Further detail on the Study Area can be found in **Section 11.3.**

Potential effects scoped out of assessment

11.9.2. Effects associated with foul drainage from the Works Area are scoped out based on the assumption that any future sewer or foul drainage infrastructure will discharge directly out to the Severn Estuary (and not to the rhynes to the east of the Works Area) given that appropriate foul drainage infrastructure is already in place and is of a sufficient capacity.

11.9.3. There are a number of existing abstraction and discharge locations associated with HPB. These locations are situated within tidal offshore waters and therefore are not part of the onshore surface water and flood risk Study Area (as there are no onshore abstractions). Effects on existing abstractions and discharges within the Study Area are therefore scoped out of the surface water and flood risk assessment on the basis that existing licences within the Study Area belong to HPA, HPB and HPC, and because they are all from or to offshore tidal waters. These effects will be assessed as appropriate in **Chapter 9: Marine Biodiversity** and **Chapter 10: Coastal Management and Water Quality**. (i.e. outside of the surface water and flood risk Study Area). Permits relevant to the surface water and flood risk assessment are listed in **Table 11-5.**

11.9.4. The potential increase in fluvial flood risk towards the Works Area and third-party receptors as a result of discharges from the Works Area has also been scoped out, as proposed discharges are to the Severn Estuary via the existing drainage system and not to surrounding inland watercourses. There will therefore be no increase in fluvial flood risk as a result of the Proposed Works.

11.9.5. The are no new basement areas or deep below-ground structures proposed that could result in changes to groundwater flood risk to off-site areas as a result of the Proposed Works due to changes in groundwater flow or storage volumes. Further, in line with the embedded mitigation measures outlined in **Table**, any dewatering, if required, would be subject to a dewatering assessment and subsequent permitting. Hence the potential impacts from changes in groundwater flood risk have been scoped out.

Potential receptors

11.9.6. Surface water and flood risk receptor types typically fall into the following groups:

- Aquatic environment: surface watercourses and Water Framework Directive bodies and conditions supporting designated conservation sites;
- Water use: third party licensed abstractions, private water supplies or discharges; and
- Flood risk: people, properties and infrastructure at risk of flooding.

11.9.7. An assessment of effects will be carried out for a range of potential surface water and flood risk receptors which could be affected by the Proposed Works (see **Table 11-11**). The assessment will take into account the implications of future climate change. As noted above, no relevant water use receptors have been identified within the Study Area.

Table 11-11 - Receptors subject to potential effects

Receptor	Sensitivity	Reason for consideration
The Rhynes (Wick Moor / Outfall Rhyne, Hinkley Point Rhyne and Sharpham / Coal Lane Sluice Rhyne and their associated	**Very Low** – the Rhynes are classified as ordinary watercourses and are not within a reportable	The Rhynes are situated close to HPB and so may be impacted if surface water runoff originating on-site flows into them.

Receptor	Sensitivity	Reason for consideration
outfalls) including associated sluices and outfalls which drain the eastern and southern area of the Works Area and discharge into Bridgwater Bay at Hinkley Brake and the Great Arch	waterbody within the South West RBMP.	
On-site infrastructure	**Low** – on-site infrastructure that is not used and will be decommissioned within the first phase of works. **Medium** – The DWPF and OWPF are classified as more vulnerable infrastructure. **High** – The Safestore, which is classified as essential infrastructure.	Much of the current infrastructure on the site is currently at risk from various sources of flooding; proposed infrastructure may also be at risk of flooding in the absence of the proposed embedded mitigation.
On-site staff	**High** – All on-site staff are classified as a high sensitivity due to the potential loss of life	Staff will be required predominantly through the preparations for quiescence phase; however, they will also be required throughout the quiescence and final site clearance phases.
Off-site people, property and infrastructure	**Low** – access to the Works Area is considered to be low as it only provides access to HPB and HPA. **Medium** – All homes which are for permanent residential use are classified as medium sensitivity as they are more vulnerable development. **High** – All off-site people are classified as a high sensitivity due to the potential loss of life	There are multiple properties approximately 1 km south of the Works Area.

Likely significant effects

11.9.8. The likely significant surface water and flood risk effects that will be taken forward for assessment are summarised in **Table 11-12**.

Table 11-12 - Likely significant surface water and flood risk effects

Receptor	Likely significant effects
The Rhynes in the vicinity of the Works Area.	Sediment laden runoff being released from areas of ground disturbance to inland watercourses during site demolition and ground reinstatement.

Receptor	Likely significant effects
	Effects on the water quality of inland watercourses associated with accidental spillages of fuels and oils from the Works Area.
On-site infrastructure and staff (flood risk); and **Off-site people, property, and infrastructure (flood risk).**	A change in surface water runoff rates affecting flood risk on-site or to surrounding areas associated with removal of redundant buildings, construction of new buildings and resulting changes in the extent of positively drained impermeable surfaces during the decommissioning process.
	Alteration to existing surface water pathways, and changes in surface water flood risk within the Works Area and to surrounding areas from proposed groundworks.
	An increase in tidal flood risk towards the Works Area and surrounding areas as a result of the Proposed Works.

11.10 Assessment of effects

Summary of the decommissioning process

11.10.1. Detailed information on the decommissioning process is set out in **Chapter 2: The Decommissioning Process**.

11.10.2. The Proposed Works will be undertaken in three distinct phases, so the assessment of effects will therefore be assessed for each phase individually.

Preparations for Quiescence phase

11.10.3. This phase includes the de-planting, dismantling and deconstruction of all plant and buildings apart from a proposed Safestore structure. Most buildings will be demolished, and levels returned to ground level, including the filling (or partial filling) of all basements and tunnels, where possible using material generated on-site. All conventional (non-radioactive) buildings will have their concrete slabs left in-situ.

11.10.4. The Safestore structure will be a secure building on the footprint of existing facilities and will enclose the two existing reactors and debris vaults of the defueled power station. This will include 'entombment', whereby all radioactive material is gathered in one part of the power station, which will then be encased in concrete strong enough to contain radioactivity until it decays to a safe level, allowing the dismantling to be undertaken in a later phase. The structure will partially retain the existing external structure with replacement cladding. The existing reinforced concrete facades to the circulator halls are expected to be extended to the perimeter to provide effective intruder resistance, which would also provide some flood protection. The Safestore structure is planned to be built in the 9th year of decommissioning and will have a 100-year design life.

11.10.5. There will be a DWPF on-site, approximately 2,000 m^2 in area, to process low-level waste. Its planned location is on the existing contractors' compound, which was used as the fabrication area during the original power station construction. It will be required at the start of the Preparations for

Quiescence phase and will be decommissioned at the end of the phase, leading to a design life of approximately 13 years. The design is expected to be a steel-framed structure with external cladding, constructed on a concrete slab. It will consist of waste handling, waste processing and waste storage areas, plus a site office and welfare facilities for staff. Waste processing will include sort and segregation, size reduction and dismantling, shredding and compacting. The DWPF will connect to the existing adjacent surface water and foul drainage networks. It will be required to have bunding for any spills, and an active drains tank to collect liquids with a means for monitoring and transferring to a portable bowser for appropriate discharge.

11.10.6. To process operational waste, an OWPF will be required on-site. This will be of similar construction to the DWPF, but approximately 1,500 m^2 in area. Following the completion of active area deplanting during the Preparations for Quiescence phase, the OWPF will be dismantled and so will have a maximum design life of approximately 13 years.

Quiescence phase

11.10.7. This Quiescence phase will commence approximately 13 years after the Preparations for Quiescence phase begins and will last approximately 70 years. During this period the Works Area will be in a quiescent state to allow further radioactive decay to occur on materials within the Safestore, although the Site will be under continuous monitoring and surveillance and undergo periodic care and maintenance of the Safestore building. This maintenance could include inspections of drains, sumps and voids left in situ.

Final Site Clearance phase

11.10.8. Final Site Clearance will involve the deconstruction of the Safestore building, including the retrieval of operational wastes stored in the Higher Activity Debris Vaults (HADVs), final elements of active area deplanting and reactor dismantling. The decommissioning processes will be similar to those described for Preparations for the Quiescence phase, including a number of temporary buildings on-site to facilitate final clearance. This phase will take approximately 13 years and upon completion the Works Area will be left as a brownfield site and made available for future development. For the purposes of assessment, it is assumed that all Proposed Works will be completed by 2120.

Proposed Works timescales summary

11.10.9. The approximate timelines for each phase alongside any works that are scheduled to take place are summarised in **Table 11-13** below.

Table 11-13 - Proposed Works summary

Phase	Approximate timelines	Works
Defueling	2022 – 2026	Removal of 99% of nuclear material from the Site **(outside of current assessment)**
Preparations for Quiescence	2026 – 2038 *(approximately 13 years, completed by the end of 2038)*	Dismantling and deconstruction of all buildings apart from the reactor building and infilling of basements. Deconstruction of the STP.

Phase	Approximate timelines	Works
		Temporary OWPF to be built and then dismantled by the end of the phase. Temporary DWPF to be built and then dismantled by the end of the phase. Safestore to be constructed 2034 – 2038 (including entombment of radioactive material in concrete and re-cladding of the existing reactor structure) with a 100 year design life
Quiescence	2039 – 2106 *(70 years approx.)*	Only unintrusive maintenance is planned to be undertaken. Safestore building and entombed waste remains in place.
Final Site Clearance	2106 – 2117 *(12 years approx. Assumed to finish by 2120 for assessment purposes)*	Deconstruction of the Safestore building. Site remediation and final landscaping.

Surface water runoff

11.10.10. A change in surface water runoff rates affecting flood risk on-site or to surrounding areas associated with removal of redundant buildings, construction of new buildings and resulting changes in the extent of positively drained impermeable surfaces during the decommissioning process.

On-site infrastructure

11.10.11. During the Preparations for Quiescence phase, buildings comprising of the DWPF and OWPF will be constructed, and the reactor building, and ponds complex will be modified into the Safestore whilst all remaining buildings will be dismantled and removed. The new and modified buildings will be constructed within the footprint of existing buildings and areas of hard-standing, so there will be no increase in impermeable area. Further, the three buildings will also be constructed to withstand external flooding or, in the case of the OWPF and DWPF, be flood-resilient, during their lifetime, which will be secured through the Nuclear Site Safety Case. The OWPF and DWPF will then be demolished prior to the end of the Preparations for Quiescence phase and the Safestore will also be demolished during the Final Site Clearance phase.

11.10.12. Alteration to existing surface water pathways could occur due to the removal of buildings which would allow surface water to flow across these areas, so changes in surface water flood risk could arise from the decommissioning works. This may lead to an increase in the flood extent but would in turn lead to lower flood depths as there would be no increase in volume.

11.10.13. Alterations to the existing drainage system could also modify the risk of surface water flooding and impact on-site infrastructure. This could include the infilling of existing voids thus reducing available flood storage, and/or the removal of existing buildings resulting in changes to drainage pathways. However, the existing drainage system is to be left in situ. Where buildings are decommissioned and

removed on-site they will be demolished to slab level, and any voids will be filled in with clean inert material. This is likely to decrease the speed of run-off and possibly the volumes slightly.

11.10.14. Buildings that are due to be decommissioned in the first phase of works that are currently at risk from pluvial flooding will no longer be at risk (with the exception of the reactor building / Safestore), due to the fact they will have been demolished. By the end of the Final Site Clearance phase, the Safestore will also have been demolished and there will be no buildings at risk from pluvial flooding.

11.10.15. Due to the surface water sewers remaining in place and continuing to be maintained, the Safestore, OWPF and DWPF being designed to be protected from external flooding / flood-resilient during their lifetime (as outlined in **Table 11-7**), and the decommissioning of buildings possibly leading to lower surface water flood depths, it is considered that the Proposed Works may bring about a slight reduction in surface water flood risk, i.e. a positive effect which is **Very Low** in magnitude. In combination with the **High** sensitivity of the Safestore, this yields a **Minor** and therefore **Not Significant** effect and the **Medium** sensitivity of the OWPF and DWFP yields a **Minor** effect which is therefore **Not Significant** in EIA terms.

On-site staff

11.10.16. As outlined in paragraph 11.10.15, there is expected to be a Very Low (positive) change in surface water flood risk (i.e. a reduction) due to demolition of buildings. However, numbers of on-site staff, particularly those working outdoors during the Preparations for Quiescence phase and Final Site Clearance phase, could increase and be affected by surface water flooding. In accordance with the flood warning, flood response and evacuation plan in the Outline EMP, works will not be carried out during times with forecasted high rainfall, so this will negate risk posed to workers.

11.10.17. On the basis of the embedded measures in **Table 11-7**, it is considered that any changes to the surface water flood risk to on-site staff associated with the Proposed Works and required access to the Works Area during the Proposed Works would be **Very Low**, which in combination with the **High** sensitivity of these receptors, yields an effect that is **Negligible** and therefore **Not Significant** in EIA terms.

The rhynes and off-site people, property and infrastructure

11.10.18. There may be small volumes of surface water crossing the Works Area boundary in the Works Area's southern extent where the STP is currently located. However, there is not expected to be any change to the amount of run-off as a result of the Proposed Works. Due to the small amount of surface water being able to flow across the Works Area boundary it is considered that there is a **Very Low** magnitude of possible change.

11.10.19. The Rhynes are classified as being **Low** sensitivity**,** the offsite property and infrastructure as being **Low to Medium** sensitivity, and off-site people as being **High** sensitivity, therefore all yield a **Negligible** effect which is **Not Significant.**

Tidal flood risk

An increase in tidal flood risk towards the Works Area and surrounding areas as a result of the Proposed Works.

11.10.20. As noted in **Chapter 9: Coastal Management and Water Quality** any changes to the tidal current and wave regime due to the Proposed Works will be highly localised, and the associated effects on the overall marine sediment transport regime and therefore on tidal flood risk in the vicinity are

predicted to be negligible. As a consequence, any effect on tidal flood risk to any receptor arising from the proposed works will also be **Negligible** and **Not Significant**.

11.10.21. However, there will be an increase in baseline tidal flood risk to the site and surrounding area over the decommissioning period (all phases) as a result of climate change induced sea level rise. As noted above in **Table 11-7**, and as reported in detail in the FRA in **Appendix 11A**, it is proposed that flood resilience measures are integrated into the design of the OWPF, DWPF and Safestore and into site operational emergency response procedures to mitigate this increase in tidal flood risk during their lifetime.

Surface water quality

Sediment laden runoff being released from areas of ground disturbance to inland watercourses during site demolition and ground reinstatement.

The rhynes

11.10.22. The Proposed Works may lead to the increase sediment laden runoff due to ground disturbance related to the demolition and dismantling of buildings and infrastructure (during the Preparation for Quiescence phase and Final Site Clearance phase).

11.10.23. The Works Area primarily drains to the Severn Estuary via the surface water drainage system; however, it is possible that small volumes of run-off may drain off-site along the south-eastern boundary of the Works Area, in particular, in the vicinity of the STP (which will be decommissioned towards the end of the Preparations for Quiescence Phase).

11.10.24. There are no major flow paths which go from on-site to off-site and there are no sensitive surface water features near the Works Area boundary. Furthermore, good practice measures, as outlined in the HPB Safety Case and the Outline EMP, will ensure that all stock piling of materials will be outside of surface water flow paths, as well as measures such as wheel washing facilities of all work vehicles being in place, to reduce the severity and amount of sediment within runoff.

11.10.25. Overall, it is considered that the potential effects associated with the Proposed Works on the surface water quality of the surrounding surface water features will be **Low**, which in combination with the **Very Low** sensitivity of the receptor, yields a **Negligible** effect that is **Not Significant**, during the Preparation for Quiescence and Final Site Clearance phases. It therefore follows that any potential for changes in surface water quality during the latter phases (i.e. Quiescence phase and Final Site Clearance phase) are also considered to be Not Significant.

All other receptors

11.10.26. No other receptors are considered to have any significant effects relating to changes in surface water quality.

Effects on the water quality of inland watercourses associated with accidental spillages of fuels and oils from the Works Area

The rhynes

11.10.27. Works relating to the decommissioning of buildings and structures within the Works Area, particularly the STP (during the Preparations for Quiescence Phase), may lead to accidental spillages of fuels and oils which could be mobilised by the small volumes of run-off that could potentially flow across the Works Area boundary and into the rhynes.

11.10.28. Good practice outlined in the Outline EMP will be adhered to (**Table 11-5**). This includes measures to decrease the risk of spillages, including the bunding of chemical and fuel stores to 110% of capacity and ensuring that vehicle maintenance and refuelling are undertaken in designated areas where spillages can be easily maintained. This is alongside pollution incidence response planning which will further reduce the risk of spillages leaving the site into nearby rhynes.

11.10.29. On the basis of the embedded measures outlined above and included within **Table 11-5**, it is considered that the potential effects associated with the Proposed Works on the surface water quality of the surrounding surface water features will be **Low**, which in combination with the **Very Low** sensitivity of the receptor, yields a **Negligible** effect which is **Not Significant**. It therefore follows that any potential for changes in surface water quality during the latter phases (i.e. Quiescence phase and Final Site Clearance phase) are also considered to be Not Significant.

11.11 Assessment of cumulative effects

Inter-project effects

11.11.1. There is the potential for surface water and flood risk effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

11.11.2. An assessment of inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-project effects

11.11.3. A summary of the potential intra-project effects is provided in **Chapter 21: Cumulative Effects Assessment.**

11.12 Summary

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
The Rhynes	Sediment laden runoff being released from areas of ground disturbance to inland watercourses during site demolition and ground reinstatement.	Very Low	Low	Negligible (Not Significant)	Good practice in the EMP will ensure no surface water flow paths are created leaving the Works Area and so there will be no runoff entering the Rhynes.
	Effects on the water quality of inland watercourses associated with accidental spillages of fuels and oils.	Very Low	Low	Negligible (Not Significant)	Good practice in the EMP reduces the likelihood and severity of spillages and enables appropriate containment of any spillages that do occur.
On-site infrastructure	Change in surface water flood risk due to changes in hardstanding and alteration to existing pathways/surface water flood risk from proposed groundworks.	Safe store - High All other infrastructure - Medium	Very Low (positive) Very Low	Minor (Not Significant) Minor (Not Significant)	The OWPF, DWPF and Safestore will be safe from external flooding due to the embedded measures.
	Increase in tidal flood risk.	Safe store - High All other infrastructure - Medium	Very Low	Minor (Not Significant) Negligible (Not Significant)	In a current day scenario, the majority of the Works Area is not at risk from tidal flooding. The Proposed Works are not expected to change the flood risk apart from a slight increase in floodplain from Safestore demolition at the end of the final site clearance phase, when there will be no on-site receptors.

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
On-site staff	Change in surface water flood risk due to changes in hardstanding and alteration to existing pathways/surface water flood risk from proposed groundworks.	High	Very Low	Minor (Not Significant)	Following good practice outlined in the EMP (adhering to a flood warning, response and evacuation plan) will ensure no on-site staff will be at risk from any increase in surface water flooding.
	Change in tidal flood risk.	High	Very Low	Minor (Not Significant)	Following good practice outlined in the EMP will ensure that no on-site staff will be at risk from an increase in tidal flooding.
Off-site people, property and infrastructure	Change in surface water or tidal flood risk	People - High Property and infrastructure – Low - Medium	Very Low	Minor (Not Significant) Negligible (Not Significant)	The changes to off-site surface water and tidal flood risk as a result of the Proposed Works are expected to be negligible.

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Soils, geology and hydrogeology

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12 Soils, geology and hydrogeology

12.1 Introduction

12.1.1. This chapter presents the assessment of the likely significant effects of the Proposed Works with respect to soils, geology and hydrogeology, and land contamination receptors of relevance.

12.1.2. The Proposed Works include the dismantling and deconstruction of buildings and structures, in areas within and outside of the Nuclear Site Licence boundary, collectively termed the Works Area. The larger area covered by the Site is referred to in this chapter as 'the Site'. In relation to land contamination this chapter considers the potential effects of the Proposed Works due to ground disturbance in areas where there is potential for land contamination to be present due to the historical use of the Site.

12.1.3. The chapter should also be read in conjunction with **Chapter 2: The Decommissioning Process** and the following environmental aspect chapters: **Chapter 8: Terrestrial Biodiversity and Ornithology**, **Chapter 9: Marine Biodiversity**, **Chapter 10: Coastal Management and Water Quality**, **Chapter 11: Surface Water and Flood Risk** and **Chapter 7: Climate Change**, due to the potential interactions of ground conditions with ecological receptors, the water environment, and climate change.

12.1.4. This chapter is supported by the following figures provided in Volume II of this ES:

- Figure 12.1 Soils, geology and hydrogeology – environmental setting;
- Figure 12.2a Superficial geology and aquifer classification; and
- Figure 12.2b Bedrock geology and aquifer classification.

12.1.5. This chapter is supported by the following appendices provided in Volume III of this ES:

- **Appendix 12A** Land Quality – Tier 1 Preliminary Risk Assessment (2021).

12.2 Relevant legislation, policy and technical guidance

Legislation

12.2.1. The legislation in **Table 12-1** is relevant to the assessment of the effects on soils, geology and hydrogeology receptors:

Table 12-1 - Legislation relevant to soils, geology and hydrogeology

Legislation	Legislation issue
Environmental Protection Act 1990, Part IIA[1]	The Environmental Protection Act 1990 (EPA) succeeded the Control of Pollution Act 1974 (COPA) and introduced new regulations for improved management systems relating to waste and pollution. The EPA establishes legal responsibilities for pollution control for land, air and water. In respect of waste, the EPA defines the fundamental structure and authority for waste management and control of emissions into the environment. Part IIA of the EPA provides the regulatory basis for the identification, designation, and remediation of contaminated land where no other legislation applies. In the context of the Proposed Works, potential land contamination is addressed through the planning regime and the Environmental Permitting (England and Wales) Regulations 2016. As a minimum, the planning regime requires that following risk assessment, and completion of any required ground investigation and remediation for planning purposes, that land should not be capable of being determined as contaminated land under Part IIA.
The Environmental Permitting (England and Wales) Regulations 2016[2]	Streamlines the legislative system for industrial and waste installations into a single permitting structure for those activities which have the potential to cause harm to human health or the environment supporting implementation of the WFD (2006/60/EC). Permit CB3735DT[3], issued by the Environment Agency in 2019 and held by EDF Energy Nuclear Generation Limited for the disposal of radioactive waste at Hinkley Point B Power Station, is the current Radioactive Substances Regulation (RSR) Environmental Permit applicable to some of the Works Area. Permit EP3334LZ[4], issued by the Environment Agency in 2020 and held by EDF Energy Nuclear Generation Limited is the current Environmental Permit authorising the operation of combustion plant. This permit defines 'the installation' as specific items of combustion plant such as auxiliary boilers and diesel-powered pumps within the Works Area.
Nuclear Installations Act 1965[5]	The principal UK legislation for the regulation of nuclear safety at nuclear installations including power stations reprocessing facilities and facilities for the storage of bulk quantities of radioactive matter.

1 Part IIA of the Environmental Protection Act 1990. (Online). Available at: http://www.legislation.gov.uk/ukpga/1990/43/part/IIA.. (Accessed: August 2024).
2 The Environmental Permitting (England and Wales) Regulations 2016. (Online). Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents/made. (Accessed: August 2024).
3 Environment Agency. Public Registers. (Online). Available at: https://environment.data.gov.uk/public-register/radioactive-substance/registration/CB3735DT?__pageState=result-radioactive-substances-permits. (Accessed August 2024).
4 Environment Agency. Public Registers. (Online). Available at: https://www.gov.uk/government/publications/ta5-1ud-edf-energy-nuclear-generation-limited-environmental-permit-issued-eprep3334lzv004. (Accessed August 2024).
5 Nuclear Installations Act 1965. (Online). Available at: https://www.legislation.gov.uk/ukpga/1965/57. (Accessed: August 2024).

Legislation	Legislation issue
Water Resources Act 1991[6] **and** **The Anti-Pollution Works Regulations 1999[7]**	The Water Resources Act 1991 states that it is an offence to cause or knowingly permit polluting, noxious, poisonous or any solid waste matter to enter controlled waters. The Water Resources Act 1991 was revised by the Water Act 2003, which sets out regulatory controls for water abstraction, water impoundment and protection of water resources. The Anti-Pollution Works Regulations 1999 prescribe the contents of anti-pollution notices. These can be served by the Environment Agency under the Water Resources Act 1991 in instances where land contamination threatens or is affecting the water environment / controlled waters.
Environmental Damage (Prevention and Remediation) (England) Regulations 2015[8]	Requirement to ensure that the Proposed Works (where they are not already regulated under an Environmental Permit) will not cause damage to ecosystems, controlled waters or land.
The EU Water Framework Directive (2000/60/EC) (WFD) **and** **The Water Environment (Water Framework Directive) (England and Wales) 2017 Regulations**	A fundamental requirement of the WFD, which is transposed into UK law by the Water Environment (Water Framework Directive) (England and Wales) 2017 Regulations, is to attain Good Ecological Status, or Good Ecological Potential within each defined water body, by December 2027 at the latest and to ensure that any deterioration in status is prevented. The WFD requires Member States to put in place systems for managing their water environments based on natural river basin districts and underpinned by extensive environmental monitoring and scientific investigation called “river basin management”. It further requires Member States to take account of the need to recover the costs of water services as a means of encouraging sustainable use of water resources. The UK left the EU on 31 January 2020, however, some UK legislation transposing EU law is still retained. This includes legislation relating to the water environment, as detailed below in this table.
EU Groundwater Directive (GWD) (2006/118/EC) 2006[9] **and** **The Groundwater (Water Framework Directive) (England) Direction 2016[10]**	Directive 2000/60/EC, which is transposed in the UK by The Groundwater (Water Framework Directive) (England) Direction 2016, sets out general provisions for the protection and conservation of groundwater. As provided for in Article 17 of the Directive, measures to prevent and control groundwater pollution should be adopted, including criteria for assessing good groundwater chemical status and criteria for the identification of significant and sustained upward trends and for the definition of starting points for trend reversals.

6 Water Resources Act 1991. (Online). Available at: https://www.legislation.gov.uk/ukpga/1991/57/contents. (Accessed: August 2024).
7 The Anti-Pollution Works Regulations 1999. (Online). Available at: https://www.legislation.gov.uk/uksi/1999/1006/contents/made. (Accessed: August 2024).
8 European Union (2000). Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy. (Online). Available at: https://eur-lex.europa.eu/eli/dir/2000/60/oj. (Accessed: August 2024).
9 Directive 2006/118/EC of the European Parliament and of the Council of 12 December 2006 on the protection of groundwater against pollution and deterioration. (Online). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32006L0118. (Accessed: August 2024).
10 The Groundwater (Water Framework Directive) (England) Direction 2016. (Online). Available at: https://www.gov.uk/government/publications/the-groundwater-water-framework-directive-england-direction-2016. (Accessed: August 2024).

Legislation	Legislation issue
The Construction Design and Management Regulations 2015 (CDM2015)[11]	CDM2015 covers the management of health, safety and welfare when carrying out construction projects and aims to improve health and safety in the industry by helping to: ■ sensibly plan the work so the risks involved are managed from start to finish; ■ have the right people for the right job at the right time; ■ cooperate and coordinate your work with others; ■ have the right information about the risks and how they are being managed; ■ communicate this information effectively to those who need to know; and ■ consult and engage with workers about the risks and how they are being managed.
The Control of Asbestos Regulations 2012[12]	The Regulations came into force on 6 April 2012, updating and replacing the previous 2006 law, and provide minimum standards for protecting employees from risks associated with exposure to asbestos. They contain new requirements for certain types of non-licensable work with asbestos on notification of work; designating areas where you are working on asbestos; medical surveillance and record keeping. In relation to building demolition or maintenance work at premises, or on plant or equipment that might contain asbestos, it is necessary for those carrying out the work to identify where asbestos is present, its type and condition, and then to assess the risks, and manage and control these risks. During the Proposed Works there is the potential for localised Asbestos Containing Materials (ACM) to be encountered in the ground. Asbestos can also be found as loose fibres in made ground e.g., due to historical incorporation of demolition material into made ground. Compliance with CAR 2012 during construction is an embedded measure considered in the assessment and detailed in **Section 12.6.**
The Health and Safety at Work etc Act 1974[13]	The Health and Safety at Work etc Act 1974 is the primary piece of legislation covering occupational health and safety in Great Britain. It sets out the general duties which: ■ employers have towards employees and members of the public; ■ employees have to themselves and to each other; and ■ certain self-employed have towards themselves and others.

[11] The Construction Design and Management Regulations 2015. (Online). Available at: http://www.legislation.gov.uk/uksi/2015/51/contents/made. (Accessed: August 2024).
[12] The Control of Asbestos Regulations 2012 Online). Online). Available at: http://www.legislation.gov.uk/uksi/2012/632/contents/made. (Accessed: August 2024).
[13] UK Government (1974) Health and Safety at Work etc. Act 1974. (Online). Available at: https://www.legislation.gov.uk/ukpga/1974/37/contents. (Accessed: August 2024).

Legislation	Legislation issue
Regulatory Expectations for Successful Land Quality Management at Nuclear Licensed Sites[14]	Sets out an overall objective for land quality management (LQM) on nuclear licensed sites in Great Britain and provide an overview of the regulators' expectations of nuclear site licensees and operators with respect to achieving the LQM objective. These high-level expectations have been produced to promote relevant good practice; importantly, they do not specify regulatory requirements, and are not legally binding on operators.

Policy

12.2.2. A summary of the relevant policies is given in **Table 12-2.**

Table 12-2 - Policy relevant to soils, geology and hydrogeology

Policy reference	Policy relevance
National Policy	
National Planning Policy Framework (NPPF)[15]	The NPPF sets out the Government's planning policies for England, and "provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner". Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works and the assessment. The NPPF states that a site needs to be suitable for its proposed use considering ground conditions and risks arising from land instability and contamination. As a minimum, following remediation, land should not be capable of meeting the definition of contaminated land under Part IIA of the Environmental Protection Act 19901. Paragraph 123, on making effective use of land, states that planning decisions "*should promote an effective use of land… while safeguarding and improving the environment*". Paragraph 180 (a) and (e), on conserving and enhancing the natural environment, states that planning policies and decisions should contribute to and enhance the natural and local environment by "*protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan)*" and by "*preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability*." Paragraphs 189 (a) to (c), in relation to ground conditions and pollution, states that planning decisions should ensure that "*a site is suitable for its*

[14] Office for Nuclear Regulation (ONR)/ Natural Resources Wales / Scottish Environment Protection Agency (SEPA)/ Environment Agency (2014). Regulatory Expectations for Successful Land Quality Management at Nuclear Licensed Sites. (Online). Available at: https://www.onr.org.uk/documents/2014/land-quality-management.pdf. (Accessed: August 2024).

[15] Department for Levelling Up, Housing and Communities (2023). National Planning Policy Framework. (Online). Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2. (Accessed: August 2024).

Policy reference	Policy relevance
	proposed use taking account of ground conditions and any risks arising from land stability and contamination", that "*after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental protection Act 1990*", and that "*adequate site investigation information, prepared by a competent person, is available to support these assessments*". In relation to the interaction of pollution control regimes and environmental permitting regimes, paragraph 194 states that "where a planning decision has been made on a particular development, the planning issue should not be revisited through the permitting regimes operated by pollution control authorities."
Local Policy	
Adopted West Somerset Local Plan to 2032 (2016)[16]	Adopted in 2016 covering water management, nature conservation, the protection and enhancement of biodiversity, and development in proximity to HPB. Policy CC6: Water Management seeks to ensure that appropriate protection is provided for water resources in the environment and provide for maintenance of existing watercourses in development and appropriate mitigation of flood risk. This policy ensures that new development does not have an adverse impact on the availability and use of existing water resources, the existing water table level, and areas at risk of flooding by tidal, fluvial and/or surface water run-off. Policy NH6: Nature Conservation and the Protection and Enhancement of Biodiversity seeks to safeguard and enhance biodiversity and to ensure that European and international nature conservation sites are protected, and any impacts mitigated. Policy NH9: Pollution, Contaminated Land and Land Instability seeks to prevent new development being adversely affected by land contamination, and to prevent new development being adversely affected by unstable ground. All development proposals on or in proximity to land known to be, or which may be, contaminated will include measures designed to prevent an unacceptable risk to public health, the environment, and property. Policy NH10: Development in proximity to Hinkley Point Nuclear Power Station requires development proposals in the inner and outer consultation zones to be considered in consultation with the office for nuclear regulation (ONR), having regard to the scale of development proposed, its location, population distribution of the area and the impact on public safety, to include how the proposal would impact on local emergency planning arrangements and other planning criteria. The inner and outer consultation zones are shown in Appendix 2 of the Local Plan[17],

[16] West Somerset Council Adopted Local Plans. (Online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton. (Accessed: August 2024).

[17] West Somerset Council (2016) West Somerset Local Plan to 2032 – Adopted November 2016: Appendices. [online]. Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Planning%20and%20Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSWT%20%2D%20West%20Somerset%20Local%20Plan%20appendices%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy&p=true&ga=1. Accessed 2 August 2024.

Technical guidance

12.2.3. Technical guidance relevant to the assessment of soils, geology and hydrogeology is presented in **Table 12-3**.

Table 12-3 - Technical guidance relevant to soils, geology and hydrogeology

Technical guidance	Context
Land Contamination Risk Management (LCRM)[18]	Provides the technical framework for applying a risk management process when dealing with land impacted by contamination. The technical approach presented is designed to be applicable to a range of non-regulatory and regulatory contexts.
Environment Agency (2010) Guidance Managing and reducing land contamination: guiding principles (GPLC)	GPLC provides guidance on managing land contamination for landowners and developers. The document includes responses to frequently asked questions (FAQs), provides technical information and advice, and includes relevant references (although some of these are noted to be out of date, where this is the case LCRM either is the relevant updated guidance or it provides current equivalent references).
BS10175: 2011 + A2: 2017 Investigation of Potentially Contaminated Sites – Code of Practice[19]**, and BS5930:2015 Code of practice for site investigations**[20]	British Standards providing guidance and recommendations for the investigation of potentially contaminated sites.
The Environmental Protection Act 1990: Part 2A Contaminated Land Statutory Guidance (2012)	Sets out how the Part IIA regime is implemented, and the process for deciding whether land is 'contaminated land' in the legal sense of the term. It also elaborates on the remediation provisions of Part IIA, such as the goals of remediation, and how regulators should ensure that remediation requirements are reasonable.
R&D66 Guidance for the Safe Development of Housing on Land Affected by Contamination (2008)[21]	The R&D66 guidance, whilst written to be relevant to housing development, is also generally applicable to other forms of development, to existing developments and to undeveloped land, where such sites are on land affected by contamination. LCRM refers to the R&D66 Guidance in relation to

[18] Environment Agency (2020) *Land contamination risk management (LCRM): How to assess and manage the risks from land contamination.* Updated 20 July 2023. (Online). Available at: Land contamination risk management (LCRM) - GOV.UK (www.gov.uk). (Accessed: August 2024).
[19] British Standards Institution (2017). Investigation of potentially contaminated sites (BS 10175:2011+A2:2017).
[20] British Standards Institution (2015). Code of practice for site investigations (BS5930:2015).
[21] NHBC and Environment Agency (2008). R&D Publication 66: 2008, Volume 1, Guidance for the Safe Development of Housing on Land Affected by Contamination. (Online). Available at: https://www.nhbc.co.uk/binaries/content/assets/nhbc/products-and-services/tech-advice-and-guidance/guidance-for-the-safe-development-of-housing-on-land-affected-by-contamination.pdf. (Accessed: August 2024).

Technical guidance	Context
	preliminary risk assessment and the use of a risk classification matrix[22]. This approach to risk assessment is set out in the methodology section 12.7. It includes example scenarios for the likelihood and consequence classification used in land contamination assessments (see **Table 12-8** and **Table 12-9**). It is the combination of consequence and likelihood that defines the level of risk to a receptor or receptors (see **Table 12-10**). R&D66 also explains that new risks from existing contaminants can arise during construction work, including the type of activities (such as soil stockpiling and changes to ground covering) that will take place during the Proposed Works.
Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation (RSR), 2018[23]	Describes what operators of nuclear sites need to do when planning and carrying out decommissioning and clean-up. The guidance requires operators to: ▪ Produce a waste management plan (WMP) to manage disposals of radioactive waste arising from the Site (taking account of its radiological and non -radiological hazards). ▪ Produce a site-wide environmental safety case (SWESC) describing the level of protection during the period of the RSR and afterwards, up to the point where all planned work involving radioactive substances is complete. ▪ Ensure the site condition meets regulators' standards for protection of people and the environment, now and into the future, in regard to radiological and non-radiological hazards associated with radioactive substances remaining on or adjacent to the site. Waste which is not radioactive is out of scope of the RSR and falls under UK legislation transposing the Waste Framework Directive [Directive 2008/98/EC] and is referred to in the guidance as 'directive waste'[24]. However, the guidance states that operators should take an integrated approach to the WMP for the management of radioactive wastes and directive wastes, and that the plan should be in place before demolition commences.

[22] Environment Agency (2020) Guidance: LCRM: Stage 1 Risk Assessment. (Online). Available at: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm/lcrm-stage-1-risk-assessment. (Accessed: August 2024).

[23] SEPA, Environment Agency, Natural Resources Wales (2018). Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation. Version 1.0: July 2018. (Online). Available at: https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf (Accessed: August 2024).

[24] In Scotland, the principal legislation comprises the Environment Act 1995, the Landfill (Scotland) Regulations 2003 and the Waste Management Licensing (Scotland) Regulations 2011.

Technical guidance	Context
	In regulating radioactive waste on or from nuclear sites, operators must keep exposures of member of the public to ionising radiation below statutory limits and consents and as low as reasonably achievable (ALARA). Operators should carry out a programme of site characterisation (including the geological and hydrogeological conditions) and monitoring to inform the WMP and SWESC, and this should consider likely future changes (e.g., changes in hydrogeology, geological change) where these that may be significant to the SWESC. The guidance provides opportunity to leave contamination in-situ as part of the final end state, if this is deemed the optimal management strategy. The potential for the site to be disturbed in the future e.g., for exploitation of resources present on the site, must also be taken into consideration. Compliance with the guidance is an embedded measure in **Table 12-7**. Effects from radioactive wastes and discharges during the Proposed Works are scoped out of the assessment as described in **Chapter 20: Radioactive Waste and Discharges**.
Nuclear Industry Group for Land Quality, Qualitative Risk Assessment for Land Contamination, including Radioactive Contamination, Version 1.1 (2012) (NIGLQ)[25]	Provides a methodology for qualitative risk assessment (QLRA) of land contamination used widely in the nuclear industry. It covers both non-radioactive and radioactive contamination and can be applied to current site conditions or a planned future condition. The NIGLQ guidance is parallel guidance to R&D66. It is useful in providing definitions of consequences of contaminant exposure specifically in relation to radioactive contaminants. However, it is stated in the guidance that whilst it can be applied to current site conditions and to planned conditions that may exist in the future, it is not intended for assessment of risks associated with disturbing land contamination for investigation, remediation or site development purposes.
CAR-SOIL: Control of Asbestos Regulations (CAR) 2012, Interpretation for Managing and Working with Asbestos in Soil and Construction and	Provides interpretation and guidance to all involved in the management of asbestos in both soils and construction and demolition arisings in accordance with CAR 2012.

[25] NIGLQ (2012). Industry Guidance: Qualitative Risk Assessment for Land Contamination, including Radioactive Contamination, Version 1.1, June 2021. (Online). Available at: https://www.gov.uk/government/publications/industry-guidance-qualitative-risk-assessment-for-land-contamination-including-radioactive-contamination. (Accessed: August 2024).

Technical guidance	Context
Demolition Materials (2016)[26]	
Site Preparation and Resistance to Contaminants and Moisture (2013)[27]	Addresses the following requirement of the Building Regulations 2010; "*Reasonable precautions shall be taken to avoid danger to health and* *safety caused by contaminants on or in the ground covered, or to be covered by the building and any land associated with the building.*"

12.3 Data gathering methodology

Study Area

12.3.1. Typically, because soils and geological features are geographically discrete and not substantially influenced by changes to their surroundings, the effects from development and ground works on soil or geological features tend to occur at the point where a construction activity takes place. For example, soil damage due to soil handling, breaking up of rock to facilitate its excavation, compaction of soil caused by vehicle/plant movements over the soil, permanent effects on soil such as excavation and offsite disposal or sealing of soil (or a geological feature) by covering it in hard surfacing such as concrete or a building. However, there may be instances where specific activities during construction (e.g., piling or dewatering) could lead to effects on soils or geological features away from the location of the Proposed Works.

12.3.2. For land contamination, the Study Area takes into consideration the potential for contaminants to migrate off the Works Area or to migrate onto the Works Area from off-site sources to impact on receptors. The potential for on/off site contaminant migration depends on factors including the local topography, the geology, hydrogeology, hydrology, and the nature and scale of the identified sources of land contamination, the presence of preferential migration pathways, and the relevant site and surrounding land use characteristics.

12.3.3. Baseline information for land contamination acquired through various surveys is summarised below in **Table 12-4** and 1 km is considered the likely maximum spatial extent (considering contaminant degradation, dilution and dispersion in the environment) at which significant land contamination effects have the potential to be realised through potentially active contaminant linkages.

12.3.4. Therefore, for the purposes of the assessment the Study Area for soils, geology and hydrogeology has been defined as a buffer of 1 km beyond the Works Area (see **Figure 12.1**).

[26] CL:AIRE (2016). Control of Asbestos Regulations 2012 – Interpretation for Managing and Working with Asbestos in Soil and Construction and Demolition Materials: Industry guidance. London: CL:AIRE. ISBN 978-1-905046-30-0.

[27] HM Government (2013) The Building Regulations 2010: Site Preparation and Resistance to Contaminants and Moisture. (Online). Available at: https://www.gov.uk/government/publications/site-preparation-and-resistance-to-contaminates-and-moisture-approved-document-c. (Accessed: August 2024).

Desk study

12.3.5. The EIA has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by the data sources detailed in **Table 12-4**.

Table 12-4 - Data sources

Source	Summary of information provided
British Geological Survey (BGS) Onshore GeoIndex[28]	Current geological mapping, historical borehole records, digital geological maps, providing information on the solid and superficial geology within the Study Area.
Defra MAGIC interactive map[29]	Aquifer classification, groundwater vulnerability and source protection zones, provisional and post 1988 Agricultural Land Classification mapping, nature conservation designations to determine the sensitivity of groundwater receptors within the Study Area.
LandIS Soilscapes map[30]	Soil descriptions to provide details of soil properties around the Study Area.
Environment Agency, Historic Landfill Sites[31]	National historic landfill dataset defining the location of, and specific attributes for, known historical landfill sites within the Study Area. The dataset includes sites that existed before landfills were regulated.
Site Protection and Monitoring Programme Review, Hinkley Point B Nuclear Power Station (Ref. 70103015-WSP-RP-107-C02, July 2023)	Provides recent groundwater chemistry in relation to hydrocarbons for groundwater samples collected from the existing monitoring well network across the Works Area targeted to known or potential sources of hydrocarbon contamination and provides groundwater monitoring information to inform the conceptual site model (to update since the previous Site Protection and Monitoring Programme (SPMP) review in 2019, including to determine whether dewatering works on the Hinkley Point C site have any effect on groundwater within HPB.
Site Protection and Monitoring Programme Review – Radiological Addendum, Hinkley Point B Nuclear Power Station (Ref. 70103015-WSP-RP-107A-C02, July 2023)	Provides recent groundwater chemistry information in relation to targeted radiological contaminants for groundwater samples collected from the existing monitoring well network across the Study Area and surface water samples from a surface water drain (rhyne) outside the Works Area, running close to and parallel to the Works Area's eastern boundary.

[28] BGS GeoIndex. (Online). Available at: https://www.bgs.ac.uk/map-viewers/geoindex-onshore/. (Accessed: August 2024).
[29] Defra MAGIC Interactive Map. (Online). Available at: https://magic.defra.gov.uk/. (Accessed: August 2024).
[30] Soil and Agrifood Institute. Incorporating the National Soil Resources Institute, Cranfield Environment Centre (CEC), Land Information System (LandIS) Soilscapes Map. (Online). Available at: https://www.landis.org.uk/soilscapes/. (Accessed: August 2024).
[31] Environment Agency (2023). Historic Landfill Sites. (Online). Available at: https://www.data.gov.uk/dataset/17edf94f-6de3-4034-b66b-004ebd0dd010/historic-landfill-sites. (Accessed: August 2024).

Source	Summary of information provided
Land Quality – Tier 1 Preliminary Risk Assessment	Provides information on the environmental setting of the Works Area, the historical development of the Works Area and an outline of activities undertaken, present a conceptual site model (CSM) for the Works Area and identifies potential sources of contamination as Areas of Potential Concern (APCs) in an updated Land Quality Register (LQR). A Preliminary Qualitative Risk Assessment (PQLRA) is presented and recommendations for further work, based on the assessment. The report is included as **Appendix 12A**.
Qualitative Risk Assessment Update, Hinkley Point B Ground Truthing	Implements the recommendation in the 2021 Land Quality – Tier 1 Preliminary Risk Assessment to validate its findings through 'ground truthing', including verifying the location and understanding of APCs listed in the LQR, validate the existing LQR and update it based on engagement with key site stakeholders and review of any additional records available, and update the PQLRA. The report presents an updated LQR and APC map and PQLRA table and updates the recommendations from the 2021 PQLRA.

Survey work

12.3.6. Site visits were undertaken by WSP in January 2020 for the purpose of site reconnaissance and familiarisation to inform development of the scope of assessment of effects arising from the Proposed Works. This site visit was informed by dialogue with current site staff.

12.3.7. In addition to the site reconnaissance survey undertaken in 2020, EDF undertakes regular monitoring across the Site and has completed a Tier 1 Preliminary Risk Assessment and related ground truthing report (as set out in **Table 12-4**. The available information gathered from the Site has been drawn together to provide a land contamination baseline.

12.3.8. The recommendations in the 2021 PQLRA and the Qualitative Risk Assessment Update, Hinkley Point B Ground Truthing report include environmental sampling and monitoring and updates to assessments. These actions will continue as required prior to and during decommissioning to further develop the conceptual model and understanding of source-pathway-receptor linkages during the Proposed Works. Data collected from the sampling and monitoring will be used in appropriate risk assessments and risk management work. It should be noted that consideration of potentially significant effects of the Proposed Works on the coastal environmental and relating to flood risk are addressed within **Chapter 10: Coastal Management and Water Quality** and **Chapter 11: Surface Water and Flood Risk**.

Data limitations

12.3.9. The licensee undertakes land contamination assessment for the Site on an ongoing basis and in accordance with various environmental permits/ waste management licences. The assessment presented in this chapter utilises the available current assessments, as detailed in the baseline information in **Table 12-4**. The licensee's compliance with the environmental permits/ waste management licences and LCRM are embedded measures in **Table 12-7**. For land contamination, this means that further investigation and assessment, and remediation if needed, will be undertaken on a phased and prioritised basis at the Site, in accordance with industry guidance applicable at the time. The Proposed Works will enable access for ground investigation to areas of the Works Area where investigation has not been possible due to physical constraints or health and safety considerations. This means that the licensee's understanding of the ground conditions on the Site will develop as new information becomes available through ground investigation and environmental monitoring, and remediation if required.

12.4 Consultation

Pre-application Opinion

12.4.1. A Pre-application Opinion was adopted by the Office of Nuclear Regulation (ONR) on 7 December 2022. A summary of the responses relevant to soils, geology and hydrogeology, and land contamination, received in the Pre-application Opinion is presented in **Table 12-5**.

Table 12-5 - Summary of Pre-application Opinion Responses

Consideration	How addressed in the ES
Impacts on agricultural land use are omitted from the Scoping Report. The ONR states that these should be considered further in the EIA process, with the ES being clear on whether these aspects are in the scope of the EIA.	The baseline in **Section 12.5** includes information on the agricultural land surrounding the Site. The scope of the assessment in **Section 12.9** explains that effects on agricultural property due to land contamination are considered in the assessment. However, physical effects on agricultural land resources (including best and most versatile land) and associated soil resources are scoped out of the assessment on the basis that there will be no disturbance to the agricultural land east and south of the Works Area, or the Hankley Brake woodland adjacent to the Works Area, and natural soils within the Works Area had largely been removed during construction of HPB. Effects on agricultural land resources (including best and most versatile land) and associated soil resources are scoped out of the assessment as described above. Effects on geological receptors are also scoped out due to the absence of geodiversity sites in the Works Area.

Consideration	How addressed in the ES
The ONR comments that "Chapter 11 (Soils and Geology) states that consultation has not been undertaken to date and will be carried out to refine the scope and assessment methodology. This is not deemed good practice as consultation should have been carried out as part of the scoping exercise to determine the assessment methodology."	The assessment methodology for land contamination effects was included in the Scoping Report to enable comment on the approach from consultees. Consultation with the Environment Agency was undertaken on 11 July 2024 to present an overview of the findings of the Draft ES for soils and geology and to confirm the embedded environmental measures for soils and geology receptors, see **Table 12-7**.
The ONR comment that the Scoping Report defines the Study Area for soils, geology and land contamination receptors as 1 km however the Study Area for hydrogeology is not clearly set out.	The Study Area for hydrogeology is 1 km as defined in **Section 12.3**.

Non-statutory consultation

12.4.2. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

12.4.3. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

12.4.4. Responses to both the first and second rounds of non-statutory consultation are presented in the **Consultation Feedback Report**. No comments relevant to the soils, geology and hydrogeology assessment were received.

Technical engagement

12.4.5. **Table 12-6** summarises the technical engagement that has been undertaken in relation to the soils, geology and hydrogeology assessment.

Table 12-6 – Technical engagement undertaken in relation to the soils, geology and hydrogeology assessment

Stakeholder	Meeting date	Points discussed
Environment Agency	11 July 2024	To provide an overview of the assessment , potential receptors, embedded environmental measures and a summary of the predicted effects.
Somerset Drainage Board Consortium	21 August 2024	To provide an overview of the assessment , potential receptors, embedded environmental measures and a summary of the predicted effects.

12.4.6. Consultation with the Environment Agency was undertaken on 11 July to present an overview of the findings of the Draft ES for soils and geology and to confirm the embedded environmental measures

for soils and geology receptors. It was agreed at the meeting that the most recent information on the land contamination status of the Works Area would be provided to the Environment Agency,

12.5 Overall baseline

Current baseline

12.5.1. This section provides a summary of the current baseline data that is pertinent to inform the requirements for the EIA process for soils, geology, hydrogeology and land contamination for the Works Area.

12.5.2. Potential receptors of land contamination include humans (site users and offsite land users), on and off-site groundwater and surface water (controlled waters), ecological receptors and property receptors (including agricultural crops and livestock, wild animals subject to commercial fishing, the built environment, including features with historic statutory designations). This section, therefore, provides information on potential receptors identified on the Works Area or within the Study Area, and refers to baseline data in other relevant chapters of the ES where appropriate. References to the Works Area below relate only to the onshore elements of the Works Area as potential effects within the marine environment are considered in **Chapter 9: Marine Biodiversity** and **Chapter 10: Coastal Management and Water Quality**.

12.5.3. Data sources are summarised in **Table 12-4**.

Current and historical land use

12.5.4. Most of the Works Area comprises the HPB power station which ceased generating electricity in August 2022. Defueling of HPB is ongoing. The Hinkley Point A (HPA) power station, immediately west, ceased generation in 2000 and is undergoing decommissioning. To the west of HPA, the Hinkley Point C power station (HPC) is being constructed. HPA and HPB share some below ground infrastructure including drainage.

12.5.5. Within the Works Area, key features of the HPB power station include the reactor unit, active effluent treatment plant, the Combustible Radioactive Waste Disposal (CRAWD) store, a fire training area, contractor compounds, seawater pumphouse, active drain pumphouse, offices, numerous switch rooms, vehicle and fabrication workshops, bulk fuel storage, bulk chemical stores, water treatment plant and waste compounds. A sewage treatment plant is in the southeast of the Works Area and is connected to the HPB power station by an access road. Two electrical switching compounds are adjacent to the Works Area, a 400kV substation to the south of the HPB power station and a 275 kV substation to the southwest.

12.5.6. Bridgwater Bay at the Bristol Channel coast is part of The Somerset Wetlands National Nature Reserve (NNR) and other designations (see **paragraph 12.5.16**) and is immediately north of the Works Area. Established woodland known as Hankley Brake is present east and south of the Works Area. Currently the King Charles III England Coast Path runs around the east and south of the Site boundary whilst works at HPC are undergoing[32].

12.5.7. There are two historical landfills associated with HPB to the northeast and east of the Works Area, respectively. Both slightly overlap the Works Area boundary. A third historical landfill, also

[32] Somerset Council. Explore Somerset map. (Online). Available at: https://roam.somerset.gov.uk/roam/map#. (Accessed: August 2024).

associated with HPB, is located immediately south of the Works Area, this overlaps the Works Area at the west, south and east boundaries of the sewage plant[31].

12.5.8. Land immediately south of the Works Area is wooded and used for electricity transmission infrastructure, with agricultural fields beyond. The fields to the southeast of the Works Area at Wick Moor and to the south at North Moor are marshy and drained by a network of open channels (rhynes), including channels running around the southern and eastern Site boundary (see **Figure 12.1**).

12.5.9. A Scheduled Monument (Pixie's Mound) is present approximately 268 m southwest of the Works Area. Given its distance from the Works Area and groundwater flow from the Works Area being away from this feature (see **paragraph 12.5.28**), it is not considered further in this chapter in relation to potential land contamination within the Works Area. For full details of the baseline and assessment of potential effects relating to cultural heritage features see **Chapter 13: Historic Environment**.

Topography

12.5.10. The Works Area is generally flat and low lying, at an elevation of between 8 and 11 m above Ordnance Datum (m AOD). The ground is lowest immediately south of the seawall which is just beyond the northern boundary of the Works Area. North of the seawall, a wave-cut platform extends 500m into Bridgwater Bay. Wick Moor southeast of the Works Area and North Moor to the south lie at a lower elevation of around 5m AOD.

12.5.11. Beyond the Works Area, the two historical landfills immediately northeast and southeast are mounded features, reaching a maximum elevation of around 17m AOD at the south-eastern landfill. There is another mounded feature between the two landfills within Hankley Wood. Towards the Hinkley Point C site to the west, OS mapping shows the natural ground level rising slightly to highs of around 25m AOD. Groundworks are ongoing at Hinkley Point C which will result in changes to the natural ground levels.

Soils

12.5.12. Soil mapping[30] shows the soil type on the Works Area, the wooded area immediately east at Hankley Brake, and surrounding land to the west and southwest, as lime-rich loamy and clayey soils with slightly impeded drainage, high fertility and low carbon storage potential. The main land cover of these soils is typically arable agricultural land with some grassland, and they can support habitats including base-rich pastures and chalky boulder clay ancient woodlands. Within the Works Area, most of these naturally occurring soils are likely to have been removed during the construction of HPB, however they may be present within the adjacent woodland.

12.5.13. Southeast and south of the Site, at Wick Moor and North Moor, the soils are shown as loamy and sandy soils with a peaty texture and medium / high carbon storage potential. Due to naturally high groundwater these soils provide wet meadow habitats. The typical landcover is arable farming, with land drainage measures to control groundwater levels.

Agricultural land

12.5.14. The provisional Agricultural Land Classification applicable to the fields surrounding the Site to the east and south is shown mainly as Grade 4[33]. This grade is applied to land with severe limitations which significantly restrict the range of crops or level of yields and it is, therefore, not considered to be best and most versatile (BMV) land[34]. Land within the Works Area and the adjacent woodland Hankley Brake is shown as Grade 3. Land classed as provisional ALC Grade 3 land can potentially be best and most versatile (BMV) land (if it meets the criteria of Subgrade 3a), however, the naturally occurring soils within the Site and Works Area are likely to have been removed or damaged during construction of the HPB.

12.5.15. There is an Environmental Stewardship Agreement (Higher Level Stewardship) recorded on a narrow strip of agricultural land running west to east along the coast immediately east of the Site beyond Hankley Brake. The agreement is registered to the Sharpham & Sheep Commoners Association and dates from 2010[35]. Higher Level Stewardship Agreements are land management schemes designed to secure environmental benefits[36].

Ecology

12.5.16. The following ecological designations are recorded in the Study Area:

- The Severn Estuary Special Area of Conservation (SAC) and Somerset Wetlands National Nature Reserve (NNR) – noted by Natural England to be the UK's second largest remaining area of lowland peat soils[37] - are immediately offsite to the north and northeast of the onshore part of the Works Area;
- The Severn Estuary Ramsar site and Special Protection Area (SPA), and Bridgwater Bay Site of Special Scientific Interest (SSSI) are immediately north and northeast of the onshore part of the Works Area and inland, the Bridgwater Bay SSSI is 18 m northeast of the Works Area[29] and extends inland over Wick Moor to the east and south of the Works Area;
- The Hinkley Local Wildlife Site (LWS) is immediately south of the Works Area and its extent includes the sewage works in the southeast of the Works Area. This includes species-rich scrub, coastal grassland and broadleaved woodland with ponds and areas of improved grassland; and
- The broad-leaved plantation woodland immediately to the east and south of the Works Area, known as Hankley Brake, is recorded as deciduous woodland Priority Habitat by Natural England[29].

[33] Defra (2024). Data Services Platform. Provisional Agricultural Land Classification (ALC). (Online). Available at: https://www.data.gov.uk/dataset/952421ec-da63-4569-817d-4d6399df40a1/provisional-agricultural-land-classification-alc. (Accessed: August 2024).

[34] Natural England (2021). Guidance: Guide to assessing development proposals on agricultural land. (Online). Available at: https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land. (Accessed: August 2024).

[35] MAGIC interactive map. (Online). Available at: https://magic.defra.gov.uk/MagicMap.aspx. (Accessed: August 2024).

[36] Rural Development Service (2005). Environmental Stewardship, Entry Level Stewardship Handbook, Terms and conditions and how to apply. (Online). Available at: https://www.gov.uk/guidance/environmental-stewardship. (Accessed August 2024).

[37] Natural England (2023). Corporate report: Somerset's National Nature Reserves. Online).. Available at: https://www.gov.uk/government/publications/somersets-national-nature-reserves/somersets-national-nature-reserves. Accessed 7 February 2024.

12.5.17. Wick Moor and North Moor, the grazing marsh east and south of the Site and beyond Hankley Brake, are identified by the Environment Agency[38], under their remit to implement the WFD, as a Groundwater Dependent Terrestrial Ecosystem (GWDTE). The GWDTE extends around the northern boundary of the Works Area into Bridgwater Bay. The fields east and south of the site are also identified as coastal and floodplain grazing marsh Priority Habitat by Natural England. As described in **paragraph 12.5.31** groundwater flow to the south and southeast occurs in the south of the Works Area. The embedded measures in **Table 12-7**, therefore, acknowledge the potential connection between site groundwater and the GWDTE and the need for consideration of possible dewatering effects on this receptor.

Geology

12.5.18. The Works Area is predominantly covered by buildings and the remaining ground cover is a mixture of concrete hardstanding, tarmac road surfaces and gravels between paths.

12.5.19. Previous investigations, summarised in the 2021 Land Quality – Tier 1 Preliminary Risk Assessment, have found made ground across the Works Area, typically 2.5 to 3.0 m thick and largely composed of Liassic limestones and shales excavated from the deeper foundations, although the base of made ground ranges from 0.9 to 9.4m below ground level (bgl). Some localised anthropogenic materials have been recorded in made ground in previous investigations on the Works Area, including concrete, brick, timber, clinker, metal and ash[39].

12.5.20. There are two areas of BGS recorded made ground within the Works Area, associated with construction of the HPA and HPB power stations, where the land surface has been raised, these are shown on 1:50,000 BGS mapping in the northwest corner of the Works Area and in the southeast at the sewage works and are cross-boundary features (see **Figure 12-2a**). Several structures in the Works Area have deep foundations, notably the:

- reactor building (-0.4 m AOD);
- active debris vaults (-1.3m AOD)
- turbine hall (-3.1 m AOD);
- central fuel building (-1.4 m AOD);
- cooling water pumphouse (-23 m AOD); and
- cooling ponds (+1.8 m AOD).

12.5.21. Geological mapping and previous borehole records on the BGS GeoIndex[28] show the Works Area is underlain by 50 to 70 m of Lower Lias mudstones with subordinate bands and lenses of limestone dipping gently to the north. The mudstones in the upper 5 to 10 m of the Lower Lias strata have been weathered to silty clay. This unit generally exhibits a transitional boundary with the reworked natural deposits in made ground described above (**paragraphs 12.5.19** and **12.5.20**). Beneath the Lower Lias are rocks of the Mercia Mudstone Group, comprising interbedded mudstones and siltstones. The Lower Lias rocks outcrop on the foreshore to the north of HPB and the Mercia

[38] Environment Agency (2024). Groundwater Dependent Terrestrial Ecosystems (England only) data. (Online). Available at: https://www.data.gov.uk/dataset/72a149a2-1be7-441f-bc37-94a77f261e27/groundwater-dependent-terrestrial-ecosystems-england-only. (Accessed August 2024).

[39] Golder (2020) Waste Processing Facilities Ground Investigation, Hinkley Point B power Station. (Ref. 19131413.601/A.1, April 2020).

Mudstone Group beds outcrop about 500 m to the south of the Works Area. There is a prominent geological fault which runs northeast to southwest across the Works Area.

12.5.22. On the low-lying land east of the Works Area, there is a superficial covering of up to 5 m of estuarine organic clays (shown by the BGS as beach and tidal flat deposits of undifferentiated clay, silt, sand and gravel, with possible peat layers) overlying 2 to 5 m of fluvial-glacial sands. The only part of the Works Area where superficial deposits are shown by the BGS is the sewage works in the southeast, where tidal flat deposits of clay, silt and sand extend southwest to southeast over Wick Moor and North Moor. No superficial deposits are shown on HPA or HPC west of the Works Area.

12.5.23. Previous ground investigations in the Works Area have encountered some superficial deposits, as head deposits (soft to stiff grey clay, typically 1 m thick with some pebble, shell and organic content, estuarine deposits (alluvium / tidal flat deposits – as soft to firm organic clays up to 5 m thick), and fluvio-glacial sands (sandy gravely to sandy clay 2.4 to 5.2 m thick), locally underlying the estuarine deposits.

Geodiversity

12.5.24. There are no geological Sites of Special Scientific Interest (SSSIs), Regionally Important Geological or Geomorphological Sites (RIGs) or Locally Important Geological Sites (LIGs) within the Works Area or in the Study Area.

Hydrogeology

12.5.25. Groundwater is present in made ground, fluvio-glacial sands, and within limestone bands in the Lower Lias beneath the Works Area. The limestone bands are up to 1 m thick but are more typically about 0.25 m thick. Groundwater flow is mainly related to fractures and joints within the limestones, with vertical groundwater movement restricted by the intervening lower permeability mudstones.

12.5.26. Made ground does not have an aquifer classification. The Environment Agency defines the Lower Lias as a secondary A aquifer, i.e. permeable strata capable of supporting water supplies at a local rather than strategic scale and potentially providing an important source of base flow to rivers. The beach and tidal flat deposits east and south of the Works Area are classed as a secondary (undifferentiated) aquifer, indicating aquifers where it is not possible to apply either a Secondary A or B definition because of the variable characteristics of the deposits. Within a 3 km radius of HPB there are only small, licensed groundwater abstractions, for farming and domestic use, and the nearest abstraction borehole is located 1.6 km east from HPB's eastern boundary. There is potential for groundwater in made ground on the Works Area to have some connectivity to the offsite groundwater in the beach and tidal flat deposits east and south of the Works Area.

12.5.27. There are no groundwater Source Protection Zones (SPZ) within the Study Area. The Works Area and the Study Area are not within a Drinking Water Protected Area.

12.5.28. Regular groundwater monitoring (typically on a quarterly or biannual basis) is undertaken from a network of groundwater monitoring wells across the Works Area as part of the HPB Site Protection and Monitoring Programme (SPMP), and the SPMP is reviewed every four years to summarise the findings and trends, and to determine the future monitoring scope. The groundwater level monitoring confirms that there is a groundwater divide on the Works Area. The 2023 SPMP identifies the watershed as lying close to the southern end of the reactor block and this means that groundwater flows off the Works Area to the south / southeast as well as to the north, and potentially into the surrounding marshland east and south of the Works Area, which is identified by the Environment

Agency as a Groundwater Dependent Terrestrial Ecosystem (GWDTE) (see paragraph 12.5.17), as well as to the rhynes connecting to Bridgwater Bay (see paragraph 12.5.34).

12.5.29. Previous ground investigations and groundwater monitoring events have found that groundwater elevations across the Works Area typically vary from approximately 4.5 to 9.0 m AOD (<1 to 6 m bgl)[40]. Quarterly monitoring undertaken as part of the site groundwater monitoring programme between 2015 and 2018 indicated an annual range in groundwater level in the monitored boreholes of typically less than 0.5 m between low and high levels. Monitoring wells on the Works Area are installed both in the Lower Lias (aka 'Blue Lias') and made ground, and in some areas groundwater in the made ground is in continuity with groundwater in the Lower Lias, however, this is not the case in all areas of Works Area. Wells with response zones to the base of made ground are dry on some monitoring occasions indicating the made ground is periodically unsaturated.

12.5.30. Despite the proximity of the Site to the coast, previous investigations have indicated relatively limited tidal impact on groundwater flow in response to tidal movements. Continuous groundwater level monitoring shows that groundwater on the Works Area in the Lower Lias does respond to rainfall events, evidenced as a rapid increase in groundwater levels, followed by a slow steady decline.

12.5.31. An east-west trending groundwater divide runs across the central part of the Works Area through the reactor buildings and cooling ponds, dividing the groundwater flow direction on site. Groundwater in the northern area of the Works Area flows towards Bridgwater Bay in a north westerly direction and is likely influenced by the north-east to south-west trending fault line which transects the Site. Locally to the western boundary there is some indication of easterly flow onto HPB from HPA. Groundwater in the south of the Works Area flows in a south to south-easterly direction towards the surface water channels (rhynes) which are located beyond the eastern boundary.

12.5.32. It is noted that significant dewatering has been undertaken at HPC to the west of the Site, and continues as required for construction, however, groundwater level monitoring data from monitoring wells on HPB (and within the Works Area) do not indicate drawdown on HPB as a result of dewatering on HPC.

Hydrology

12.5.33. Bridgwater Bay is immediately north of the Works Area. The HPB Cooling Water Outfall is approximately 200 m north of the sea wall at the Works Area's northern boundary in a cutting of the outcropping mudstones and connects to HPB via a pumped adit. The Applicant holds a discharge consent to release final treated effluent (cooling water) via this outfall.

12.5.34. Drainage rhynes (open drainage channels) are present south and east of the Works Area on the moors. The nearest rhyne to the Works Area is 50 m southeast (adjacent to the Site to the east) and is unnamed, this runs northeast to Bridgwater Bay at Hankley Brake. To the southeast of the Site boundary, the same rhyne connects to other unnamed rhynes running east to West Brook, approximately 800 m southeast of the Works Area (see **Graphic 12-1**).

[40] Golder Associates (2014) Assessment of Impact of Dewatering on Monitoring Network

12.5.35. West Brook is not monitored by the Environment Agency and is shown outside the catchment of the nearest monitored watercourse (Stogursey Brook[41] / East Brook) which is 950m southeast of the Works Area and also discharges to Bridgwater Bay.

12.5.36. There are two small ponds in the Study Area, one at the southern end of the nature trail / footpath, 90 m east of the Works Area (adjacent to the Site), near the sewage works, and one 250 m southeast of the Works Area (135 m southeast of the Site). The buried surface water drainage network at HPB includes a series of oil interceptors and drains via gravity to the outfall via a chamber near the sea wall.

Graphic 12-1 - Unnamed rhyne (drainage channel) immediately east of the Site boundary (woodland at Hankley Brake visible)

12.5.37. The south-eastern portion of the Works Area is within a Nitrate Vulnerable Zone (NVZ) (Stogursey Brook NVZ) defined to protect surface water quality.

Land contamination

Waste licences including landfills

12.5.38. There are three historical landfills within the Study Area, two of which have Waste Management Licences, which are now regulated under The Environmental Permitting (England and Wales) Regulations 2016. These are to the northeast, east and south of the Works Area. Available landfill extent information from the Environment Agency[31] indicates that two of the landfills overlap the Works Area boundary. Licence details are as follows:

- EDF Energy Nuclear Generation Limited holds an Environmental Permit (Permit No. NP3590FA, permit type: A7: Industrial Waste Landfill [Factory curtilage]) for the 'Hinkley Point B Landfill site' at 321500, 145700. This landfill overlaps the Works Area at the west, south and east boundaries

[41] Environment Agency, Catchment Data Explorer. Stogursey BK Water Body. (Online). Available at: https://environment.data.gov.uk/catchment-planning/WaterBody/GB108052021340. (Accessed: August 2024).

of the sewage plant, however, most of the landfill is outside the Works Area and is a mounded area with grass and trees around the sewage works. The permit was issued in 1990 and its status is 'closure'. Post closure monitoring is carried out by the Applicant. This landfill accepted waste from HPB comprising solid and inert and non-hazardous construction and demolition waste of concrete, brick rubble including steel reinforcement and mesh, tarmacadam, glass, natural excavated material including topsoil and subsoil, site gardening waste, and excavated material from a former spoil heap within the landfill extent. This landfill area includes land referred to in previous reports as the HPB 'spoil tip', and prior to regulation under The Environmental Permitting (England and Wales) Regulations two Waste Disposal Licences (WDLs) under the Control of Pollution Act 1974, WDL 212 and WDL 291, applied to this area.

- EDF Energy Nuclear Generation Limited holds an Environmental Permit (Permit No. GP3590FF, permit type: A10: In-House Storage Facility) for the 'Hinkley Point Landfill site' at 321500, 145900. This landfill overlaps the Works Area at the southeast area of the HPB power station, however, most of the landfill is outside the Works Area and takes the form of a single grassed mound feature with trees. The permit was issued in 1980 and its status is 'closure'. Post closure monitoring is carried out by the Applicant. This landfill accepted asbestos, including crocidolite, arising from construction and demolition activities at HPB, concrete cells were used for disposal. Prior to regulation under The Environmental Permitting (England and Wales) Regulations, Waste Disposal Licence WDL 58 applied to this area.

12.5.39. The historical landfill to the northeast of the Works Area (at 321527, 146279) was licensed under the Control of Pollution Act 1974 under Waste Disposal Licence WDL 292. This licence has been surrendered. This landfill accepted waste from the HPB power station comprising solid and inert and non-hazardous construction and demolition waste of concrete, brick rubble including steel reinforcement and mesh, tarmacadam, glass, natural excavated material including topsoil and subsoil, and site gardening waste.

12.5.40. A U6 waste exemption (registration WEX273339, dated 5 May 2021, expiry date 4 May 2024) is recorded on the public register at Hinkley Point B Power Station[3], this relates to the use of (imported) sludge from another wastewater treatment plant to re-seed the wastewater treatment plant (i.e. to add suitable bacteria for the biological processes at the plant). This exemption is not considered further in relation to land contamination effects related to the Proposed Works, however, the sewage treatment works is identified below as a potential source of contamination.

Land contamination

12.5.41. The latest assessment of the environmental risks posed by land contamination at HPB is the Qualitative Risk Assessment Update, Hinkley Point B Ground Truthing report, which provides an update to the 2021 Land Quality – Tier 1 Preliminary Risk Assessment and should be read in conjunction with that report.

12.5.42. The Ground Truthing report covers all land within the Works Area and identifies Areas of Potential Concern (APCs) where further characterisation of land contamination or remediation may be needed. The report updates the land quality baseline for HPB and identifies recommended improvements to the land quality network. It includes data obtained from SPMP monitoring up to 2023. Although it does not include a full qualitative risk assessment, it provides commentary on the significance of the risk posed by each APC to enable prioritisation of the APCs for further work, based upon the NIGLQ risk assessment guidance[25].

12.5.43. The scope of the report includes radiological contaminants and non-radiological contaminants associated with the APCs. The assessment in this chapter scopes out potential effects on land contamination receptors due to the handling of radioactive material and radioactive wastes during defuelling, deplanting and deconstruction (as described in **Chapter 2 The Decommissioning Process**), however, it considers potential effects associated with the disturbance of pre-existing radiological and non-radiological contamination in the ground during the Proposed Works, as identified in the Ground Truthing report and the 2021 Land Quality – Tier 1 Preliminary Risk Assessment.

12.5.44. The identified APCs within the Works Area include areas where hydrocarbons are used and stored, various HPB drainage systems and HPA redundant and replacement active effluent lines which enter the Works Area from the west, landfills, oil-filled (electrical) cables, a sewage works, gas plants, the CRAWD compound, and a fire training area. Outside the Works Area, a former sewage works and a waste mound on HPA to the west are identified as APCs.

12.5.45. The two large substation compounds adjacent to the Works Area, as described in paragraph 12.5.4, are potential offsite sources of contamination due to the current and historical presence of oil-filled equipment and cables. Due to the groundwater flow direction being generally south-southeast in this area of the Site, the potential for contamination migrating onto the Works Area is limited, other than potentially at the sewage works which is 30m southeast of the 400kV substation compound, and immediately east of the 275kV substation.

12.5.46. The 2024 Ground Truthing report identifies 11 moderate risk APCs and five high risk APCs, with the high-risk APCs comprising:

- HPB_APC1: The HPA active effluent discharge line, which includes brick-built active effluent valve pits (AEVPs), some of which are recorded to have leaked historically. Some replacements to structures have been made and the AEVP structures are recorded to be managed under a best available technique (BAT) assessment. Further intrusive ground investigation and soil and groundwater sampling was recommended.
- HPB_APC7: The CRAWD compound includes underground structures including a reception pit where active solid and non-aqueous phase liquid wastes have been stored prior to offsite treatment and disposal. Groundwater flow may be to the east/northeast. Installation of downgradient groundwater monitoring wells was recommended.
- HPB_APC15: The gas turbine complex has non-aqueous phase liquid (NAPL) present in the ground, potentially due to leakage of hydrocarbons from a blind sump. The information reviewed for the 2021 PQLRA indicates that the NAPL is not resulting in dissolved phase contamination, and under the normal (or baseline) conditions does not appear to be migrating, or is only migrating slowly, towards Bridgwater Bay. It is noted that faster migration would be possible via service corridors. It is recommended that the potential impact of any proposed changes to the built environment at the gas turbine complex should be risk assessed before being implemented (the applicant undertakes regular environmental monitoring and risk assessment as outlined in **Table 12-7,** including measures 12.2, 12.3, and 12.11). Remediation is recommended at an opportune time during the decommissioning of buildings, tank farms and pipework in this area.
- HPB_APC19: the fire training ground, in relation to recorded hydrocarbon releases and the potential for fire-fighting foams containing types of polyfluoroalkyl substances (PFAS) including perfluorooctanesulfonic acid (PFOS) / perfluorooctanoic acid (PFOA) aka ‘C8’ to have been used.

Fire-fighting foam stored currently at the fire training ground does not contain PFAS, however, potential for historical contamination remains. Ground investigation including shallow boreholes and groundwater monitoring wells is recommended.

- HPB_APC37a and b: maintenance testing of the Gas Circulator Fire Suppression Systems may have resulted in the release of fire-fighting foams containing PFOS / PFOA being discharged to gravel surfaced area. It is recommended in the first instance that further information on the use and discharge of this foam is gathered to inform further assessment of the potential impacts on the ground / groundwater.

12.5.47. No very high risk APCs have been identified which would require immediate action, such as characterisation and/ or remediation, to lower the risk rating

12.5.48. Regular groundwater monitoring from a network of existing monitoring wells is completed within the Works Area under the remit of the SPMP for HPB for boreholes targeting radioactive and / or non-radioactive contaminants. Surface water sampling is also undertaken for radiological contaminants. The most recently available SPMP reports are detailed in **Table 12-4**.

Future baseline

12.5.49. Without the Proposed Works, the Site would remain subject to the current regulatory regimes relevant to the prevention, investigation and remediation of land contamination by radiological and non-radiological contaminants, as identified in **Table 12-1** and **Table 12-3**. It is, therefore, reasonable to assume that if there was a detrimental change from the baseline condition within the Site or Study Area due to accidental release(s) or a change to the ground conditions that resulted in contamination being mobilised (e.g., other ground works), that this would be picked up through the licensee's regular environmental monitoring and land quality assessment, with appropriate response undertaken in accordance with the procedures outlined in the embedded measures in **Table 12-7** including 12.2, 12.3, and 12.11. There is also a regulatory requirement for sites regulated under EPR whereby remedial action is typically required to restore conditions back to baseline in order to surrender a permit/ licence, if this has not already been undertaken.

12.5.50. With respect to land contamination management, nuclear licensed sites do not fall under the scope of Part IIA of the Environmental Protection Act, however, they do fall within the scope of the Town and Country Planning Act 1990, under which land contamination is a material consideration. For future developments which take place within the Study Area, the Town and Country Planning Act 1990 requires the consideration of the potential for land contamination to be present, in order for the planning authority to assess whether the Site is suitable for development or redevelopment. Where necessary, a developer would be required to carry out remediation of contamination to ensure the development site is suitable for the proposed end use. Therefore, it is reasonable to conclude that in the absence of the Proposed Works there would not be a detrimental change in baseline conditions over time within the Study Area.

12.5.51. Long-term changes in the baseline soil condition, and geological and hydrogeological conditions at the Site that will be relevant to land contamination during the timescale from the Preparations for Quiescence phase, though to the Final Site Clearance include:

- climate change influencing rainfall runoff and recharge;
- changes to groundwater levels and flow directions, which could in turn influence contaminant migration and land quality;

- changes to the future hydrogeological flow regime; and
- some contaminants in soils and groundwater will naturally attenuate and decay over time.

12.5.52. Due to the duration of the Proposed Works, through Quiescence to the end of Final Site Clearance, consideration of climate change in future land contamination risk assessment is an embedded measure in **Table 12-7**. Without the Proposed Works it is still likely that consideration of climate change in land contamination assessments would be needed for the licensee to comply with other environmental legislation, and therefore potential land condition effects arising due to climate change would be assessed and appropriate actions taken. Consideration of climate change in regard to pluvial and coastal flood risk to the Proposed Works, and specifically in relation to the proposed Safestore is included in **Chapter 11: Surface Water and Flood Risk**. As noted above, further work to integrate consideration of climate change in the assessment of land contamination risks is an embedded measure in **Table 12-7**.

12.6 Embedded environmental measures

12.6.1. As part of the design process, embedded environmental and good practice measures are proposed to reduce the potential for impacts, as summarised in **Table 12-7**.

Table 12-7 - Summary of embedded environmental and good practice measures

Measure identifier	Embedded measure	Compliance mechanism
M12.1	Where the Proposed Works have the potential to affect Site drainage inputs or change the permeability of the ground surface, the suitability and integrity of existing drainage systems, and potential requirement for alternative drainage arrangements or repairs, will be assessed. Suitable drainage systems will be defined in a decommissioning drainage plan prior to the relevant Proposed Works activity commencing.	Environmental Management Plan (EMP)
M12.2	Compliance with Nuclear Site Licence conditions. This includes the following: - The Nuclear Site Licence for the Site includes Licence Condition 34 (LC34) "*leakage and escape of radioactive materials and radioactive wastes*" which requires that licensees ensure, as far as is reasonably practicable, that radioactive material and radioactive waste are adequately controlled/ contained to prevent leakage/ accidental releases of this material, and also that monitoring measures are in place that would pick up such leaks/ emissions if they did occur, so that these could be investigated and relevant authorities notified. The licensee complies with this licence condition and as part of its commitment to detection of releases, undertakes regular groundwater monitoring and offsite surface water monitoring of radiological and non-radiological contaminants, including but not limited to SPMP monitoring. This will continue for as long as required to support ongoing Environmental Permit compliance and Permit Surrender in accordance with Environment Agency permitting guidance and permit-specific requirements, and compliance with and ultimately release from RSR. The licensee also complies with the guidance on the requirements for release from radioactive substances regulation (GRR) which requires that the potential for combined impacts where there are several environmental	Environmental Permitting (England and Wales) Regulations 2016 (EPR 2016)

Measure identifier	Embedded measure	Compliance mechanism
	permits held for adjoining sites (such as 'A' and 'B' nuclear power station sites) is considered in the SWESC. The monitoring scope, testing suites, and locations of monitoring points will continue to be reviewed so that necessary changes can be implemented e.g., in response to changes to operations covered under the Permit or observed / suspected changes in site condition. If monitoring indicates a deterioration in groundwater quality or surface water quality, appropriate measures will be undertaken to investigate. Records will continue to be kept of all associated monitoring, investigations, and remediation.	
M12.3	The site characterisation and assessment of land contamination risks to update and implement the WMP and SWESC during the Proposed Works (except for areas of the Site where specific requirements for the assessment of site condition apply, such as EPR2016), will be in accordance with the phased approach set out in LCRM. The latest relevant report in accordance with this approach is the Qualitative Risk Assessment Update, Hinkley Point B Ground Truthing, which contains recommendations for further actions to characterise the soils and groundwater on the Works Area and improve understanding of local groundwater flows. These assessments, and industry guidance for ground investigation and land contamination assessment (such as published by CL:AIRE) will inform the design of investigations, environmental monitoring, and ground works to achieve the site reference state, and to validate its achievement. This characterisation work will consider potential legacy radioactive and non-radioactive contamination associated with the historical use of the Site as well as the current status. Groundwater risk assessment to inform site characterisation will be undertaken in accordance with Environment Agency guidance[42].	EMP
M12.4	Consideration will be given to climate change effects in land contamination risk assessment completed during the Proposed Works.	Integrated Management System (IMS)
M12.5	Design and construction of new groundwater monitoring wells for site characterisation or other environmental purposes will be in accordance with industry guidance such as Environment Agency Science Report SCO20093, and BS 10175, to avoid the creation of new preferential migration pathways.	Good practice measure
M12.6	Continued Implementation of the Site Protection and Monitoring Programme (SPMP) and appropriate groundwater monitoring and management regime in accordance with the IMS, in accordance with best practice. If wells cannot be retained for ongoing environmental monitoring purposes, or are no longer required, these will be decommissioned in accordance with Environment Agency guidance for decommissioning redundant boreholes and wells. Wells that become unexpectedly damaged or unusable will be subject to assessment to confirm whether they need to be replaced.	EMP

[42] Environment Agency, Defra (2018). Groundwater risk assessment for your environmental permit. (Online). Available at: https://www.gov.uk/guidance/groundwater-risk-assessment-for-your-environmental-permit. (Accessed: August 2024).

Measure identifier	Embedded measure	Compliance mechanism
M12.7	Contractors will be made aware of their statutory responsibility and the pollution risk and controls, which will be managed in accordance with the IMS, which aligns to best practice guidance.	IMS
M12.8	Pollution risk and pollution controls will be managed in accordance with the IMS, which aligns to best practice guidance.	EMP
M12.9	Risk assessments and method statements for the Proposed Works will include measures to limit/control potential dust emissions during activities including soil excavation and stockpiling, or from the action of wind on soils exposed by the removal of hardstanding or stockpiles, which in turn can enable the migration of contaminants in soils to other receptors. Best practice air quality management measures (see **Chapter 6: Air Quality**) will be applied as described in Institute of Air Quality Management (IAQM) guidance on the Assessment of Dust from Demolition and Construction 2024, version 2.2[43].	EMP
M12.10	Potential risks to soil, groundwater and surface water will be considered when generating suitability for use criteria for the potential re-use of waste materials on site, particularly for any void filling below the water table.	EMP
M12.11	Continual management of land condition data in accordance with the IMS. Site characterisation work undertaken during the Proposed Works will be added to this system to keep records of the land quality on the site.	EMP
M12.12	During the Proposed Works, construction strategies will be implemented that will seek to maximise the reuse of excavated materials or demolition derived materials that are suitable for the intended re-use in the context of the future site use. Waste management planning and reuse of material will be completed in accordance with the Definition of Waste Code of Practice (DoWCoP), use of a Materials Management Plan (MMP) (as relevant) and the HPB WMP and SWESC. These will include how stockpiles will be managed and segregated to avoid cross-contamination and will include the anticipated programme for storage of materials. Where it is identified that materials cannot be re-used on the Works Area or on the Site, these will be suitably contained to prevent uncontrolled releases to the environment, and an off-site disposal option at a suitably licensed facility by a licensed waste carrier will be identified and collection arranged at the earliest opportunity.	EMP
M12.13	Decommissioning plans for the Proposed Works will reflect that delicensing and surrender of the RSR permit are distinct regulatory processes with different requirements. Specifically, the plans will note that the programme of validation monitoring required to demonstrate that the Site reference state has been achieved may differ from the clearance survey required for delicensing. The Site end state description will continue to be clarified as the plans are developed during the Proposed Works, and the plans updated as and when required.	EMP
M12.14	All aspects of the Proposed Works will be in accordance with the Health and Safety at Work etc Act (1974)[13] and regulations made under the Act, and the	EMP

[43] IAQM (2024). Assessment of dust from demolition and construction 2024 V2.2. (Online). Available at: https://iaqm.co.uk/guidance/. (Accessed: August 2024).

Measure identifier	Embedded measure	Compliance mechanism
	Construction (Design and Management) Regulations 2015. Potential risks to human health from any unexpected ground contamination will be avoided by the use of PPE and by adopting appropriate working practices. These could include the use of field monitoring equipment if potential for vapours is anticipated, to minimise potential for personnel to come into direct contact with contaminants, and protocols for suspect materials encountered during groundworks to be characterised through sampling and testing to identify appropriate further actions.	
M12.15	Asbestos and asbestos containing materials will be managed in according with the IMS, aligned to legal requirements (Control of Asbestos Regulations 2012 (CAR 2012))	EMP
M12.16	The potential for dewatering to be required during all stages of the Proposed Works will be considered in advance of excavation activities, and if dewatering is anticipated to be needed, an assessment will be carried out in advance to identify suitable environmental measures to minimise the potential for contaminant mobilisation and to protect the water environment and ensure compliance with water environment legislation. This will include consideration of potential effects on the flow of groundwater from the Works Area towards the groundwater dependent terrestrial ecosystem (GWDTE) within Bridgwater Bay SSSI) on farmland at Wick, to determine whether additional mitigation measures are needed to avoid / limit impacts on the GWDTE. The licensee will ensure compliance with the Environment Agency for water abstraction[44]. Consideration of effects on the GWDTE will include consideration of ecological survey data and may require groundwater modelling inputs.	EMP

12.7 Assessment methodology

12.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this chapter to assess effects on soils, geology and hydrogeology, and land contamination receptors, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the soils, geology and hydrogeology, and land contamination, assessment in the ES.

12.7.2. Due to the absence of sensitive geological / geodiversity receptors within the Works Area and Study Area, potentially significant effects on geology / geodiversity receptors have been scoped out of the assessment as explained in **Section 12.10**. Effects on soil resources and soil functions are also scoped out of the assessment as no physical disturbance of sensitive receptors is needed for the Proposed Works. No methodology for assessing effects on these receptors is, therefore, provided in this chapter.

12.7.3. The assessment and management of land contamination is usually based on the risk presented by the presence of a hazard (for example, contamination) for a given circumstance (i.e. the probability and consequence of an event occurring). However, EIA seeks to identify the magnitude of a change

[44] Environment Agency (2023). Guidance: Apply for a water abstraction or impounding licence. (Online). Available at: https://www.gov.uk/guidance/water-management-apply-for-a-water-abstraction-or-impoundment-licence. (Accessed: August 2024).

in status from baseline (impact) caused by a proposed development and the consequences of those changes (effects).

12.7.4. Permanent effects on hydrogeology such as changes to rainfall infiltration, changes to groundwater levels or the hydrogeological flow regime are scoped out of the assessment, as explained in **Section 12.10**. However, the potential for effects on the offsite GWDTE within the Bridgwater Bay SSSI due to dewatering activity on the Works Area during the Proposed Works is considered in the assessment. At this stage no quantitative assessment has been undertaken, as the nature of the assessment would depend on the location and nature of the planned activity, however, the embedded measures in **Table 12-7** include a commitment by the licensee to undertake quantitative assessment of potential dewatering effects on the GWDTE if this is needed. This potential effect is assessed qualitatively in paragraphs 12.11.44 to 12.11.46.

General approach

12.7.5. The basis for the evaluation of the significance of effects used in this assessment for land contamination receptors is the change in risks from baseline conditions to the risks during the activities required for the Proposed Works (and up to the end of the Proposed Works).

12.7.6. The risk levels used in the assessment of effects on land contamination receptors, are defined using the process of land contamination risk assessment set out in the LCRM guidance[18]. The assessment of risks from land contamination is based upon the identification and subsequent assessment of a contaminant linkage. A contaminant linkage requires the presence of:

- a source of contamination;
- a receptor capable of being adversely affected by the contamination; and
- an active pathway capable of exposing a receptor to the contaminant.

12.7.7. The risk assessment aims to assess the significance of each potential contaminant linkage. The key to the classification is that the designation of risk is based upon the consideration of both of the following:

- the magnitude of the potential consequence (severity). It takes into account both the potential severity of the hazard and the sensitivity of the receptor; and
- the magnitude of probability (likelihood). It considers both the presence of the hazard and receptor and the potential for a pathway to be realised between them.

12.7.8. The definitions for the qualitative risk assessment have been taken from Guidance for the Safe Development of Housing on Land Affected by Contamination Annex 4[21].

12.7.9. The likelihood classifications for the contaminant linkages being realised is presented in **Table 12-8**.

Table 12-8 - Likelihood classification of contaminant linkage being realised

Classification	Definition	Examples
High Likelihood	There is a contaminant linkage, and an event would appear very likely in the short-term and almost inevitable over the long-term, or there is evidence at the receptor of harm or pollution.	a) Elevated concentrations of toxic contaminants are present in soils in the top 0.5 m in a residential garden. b) Ground/groundwater contamination could be present from chemical works, containing a number of Underground Storage Tanks (USTs).
Likely	There is a contaminant linkage, and all the elements are present and in the right place, which means that it is probable that an event will occur. Circumstances are such that an event is not inevitable, but possible in the short-term and likely over the long-term.	a) Elevated concentrations of toxic contaminants are present in soils at depths of 0.5-1.0 m in a residential garden, or the top 0.5 m in public open space. b) Ground/groundwater contamination could be present from an industrial site containing a UST present between 1970 and 1990. The tank is known to be single skin. There is no evidence of leakage although there are no records of integrity tests.
Low Likelihood	There is a contaminant linkage, and circumstances are possible under which an event could occur. However, it is by no means certain that even over a long period such an event would take place and is less likely in the shorter term.	a) Elevated concentrations of toxic contaminants are present in soils at depths >1 m in a residential garden, or 0.5-1.0 m in public open space. b) Ground/groundwater contamination could be present on a light industrial unit constructed in the 1990s containing a UST in operation over the last 10 years – the tank is double skinned but there is no integrity testing or evidence of leakage.
Unlikely	There is a contaminant linkage, but circumstances are such that it is improbable that an event would occur even in the very long-term.	a) Elevated concentrations of toxic contaminants are present below hardstanding and do not pose a risk to groundwater. b) Light industrial unit <10 years old containing a double skinned UST with annual integrity testing results available.

12.7.10. The classification of consequence is presented in **Table 12-9**.

Table 12-9 - Classification of consequence

Classification	Human Health	Water environment	Geodiversity / Sensitive ecosystems	Property / structures/ crops and animals	Examples
Severe	Highly elevated concentrations likely to result in “significant harm” to human health as defined by the Environmental Protection Act (EPA) 1990, Part IIA, if exposure occurs.	Equivalent to Environment Agency Category 1 pollution incident[45] including persistent and/or extensive effects on water quality; leading to closure of a potable abstraction point; major impact on amenity value or major damage to agriculture or commerce.	Major damage to a geodiversity site. Major damage to aquatic or other ecosystems, which is likely to result in a substantial adverse change in its functioning or harm to a species of special interest that endangers the long-term maintenance of the population.	Catastrophic damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance[46] as death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Major fish kill in surface water from large spillage of contaminants originating from the Proposed Works. Highly elevated concentrations of Hazardous or priority substances present in groundwater close to small potable abstraction (high sensitivity). Explosion, causing building collapse (can also equate to immediate human health risk if buildings are occupied).
Medium	Elevated concentrations which could result in “significant harm” to human health as defined by the EPA 1990, Part IIA if exposure occurs.	Equivalent to Environment Agency Category 2[47] pollution incident including significant effect on water quality; notification required to abstractors; reduction in amenity value or significant damage to agriculture or commerce.	Significant damage to a geodiversity site. Significant damage to aquatic or other ecosystems, which may result in a substantial adverse change in its functioning or harm to a species of special interest that may endanger the long-term maintenance of the population.	Significant damage to crops, buildings or property.	Significant harm to humans is defined in the Contaminated Land Statutory Guidance[46] As death, life threatening diseases (for example, cancers), other diseases likely to have serious impacts on health, serious injury, birth defects, and impairment of reproductive functions. Damage to building rendering it unsafe to occupy, for example, foundation damage resulting in instability. Ingress of contaminants through plastic potable water pipes.
Mild	Exposure to human health unlikely to lead to “significant harm”.	Equivalent to Environment Agency Category 3 pollution incident[48] including minimal or short-lived effect on water quality; marginal effect on amenity value, agriculture or commerce.	Minor damage to a geodiversity site. Minor or short-lived damage to aquatic or other ecosystems, which is unlikely to result in a substantial adverse change in its functioning or harm to a species of special interest that would endanger the long-term maintenance of the population.	Minor damage to crops, buildings or property.	Exposure could lead to slight short-term effects (for example, mild skin rash). Surface spalling of concrete.
Minor	No measurable effects on humans	Equivalent to insubstantial pollution incident with no observed effect on water quality	Limited impact on a geodiversity site such that no effect is observable. Equivalent to insubstantial pollution incident with no observed effect on an ecosystem.	Repairable effects of damage to buildings, structures	The loss of plants in a landscaping scheme. Discoloration of concrete.

[45] Meaning an incident that has had a major impact on the environment. Environment Agency (undated). *Pollution incidents*. (Online). Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20141203190207/http://apps.environment-agency.gov.uk/wiyby/37821.aspx (Accessed: August 2024).
[46] In Scotland, here: Natural Scotland, Scottish Executive (2006) *Environmental Protection Act 1990 - Part IIA Contaminated Land: statutory guidance edition 2.* (Online). Available at: https://www.gov.scot/publications/environmental-protection-act-1990-part-iia-contaminated-land-statutory-guidance/. (Accessed: August 2024).
[47] Meaning incidents that have had a significant impact on the environment. Environment Agency (undated). Pollution incidents. (Online). Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20141203190207/http://apps.environment-agency.gov.uk/wiyby/37821.aspx. (Accessed: August 2024).
[48] Meaning incidents that have had a minor impact on the environment.

12.7.11. The risk matrix to link the likelihood and consequence is shown in **Table 12-10**.

Table 12-10 - Risk matrix

Likelihood / Potential consequence	Unlikely	Low	Likely	High
Severe	Moderate/Low Risk	Moderate Risk	High Risk	Very High Risk
Medium	Low Risk	Moderate/Low Risk	Moderate Risk	High Risk
Mild	Very Low Risk	Low Risk	Moderate/Low Risk	Moderate Risk
Minor	Very Low Risk	Very Low Risk	Low Risk	Low Risk

12.7.12. The overall risk definitions are summarised in **Table 12-11.**

Table 12-11 - Risk definitions

Risk	Definition
Very High	There is a high probability that severe harm could arise to a designated receptor from an identified hazard at the Site without remediation action OR there is evidence that severe harm to a designated receptor is already occurring. Realisation of that risk is likely to present a substantial liability to the Site owner/or occupier. Investigation is required as a matter of urgency and remediation works likely to follow in the short-term.
High	Harm is likely to arise to a designated receptor from an identified hazard at the Site without remediation action. Realisation of the risk is likely to present a substantial liability to the Site owner/or occupier. Investigation is required as a matter of urgency to clarify the risk. Remediation works may be necessary in the short-term and are likely over the longer term.
Moderate	It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, and if any harm were to occur it is more likely that the harm would be relatively mild. Further investigative work is normally required to clarify the risk and to determine the potential liability to site owner/occupier. Some remediation works may be required in the longer term.
Low	It is possible that harm could arise to a designated receptor from identified hazard, but it is likely at worst that this harm if realised would normally be mild. It is unlikely that the Site owner/or occupier would face substantial liabilities from such a risk. Further investigative work (which is likely to be limited) to clarify the risk may be required. Any subsequent remediation works are likely to be relatively limited.
Very Low	It is a low possibility that harm could arise to a designated receptor, but it is likely at worst, that this harm if realised would normally be mild or minor.

Determination of significance

12.7.13. There is no established guidance on how to use the LCRM risk assessment approach as the basis for evaluation of the significance of effects on land contamination receptors within the EIA process.

12.7.14. The methodology used in this assessment has, therefore, been developed using professional judgment, evaluating the change in risk from baseline conditions to those during and following the Proposed Works. In order to define the baseline risk, the initial assessment and classification of risk is carried out for the Study Area in its pre-works state. A separate assessment of risk is then conducted for the site post-works (including environmental measures inherently embedded in the development) to enable an evaluation of the change in risk due to the Proposed Works.

12.7.15. In considering the post-works risks, embedded environmental measures have been taken into account.

12.7.16. **Table 12-12** uses the risk classification pre- and post-works as the basis for a significance evaluation matrix for the purposes of EIA.

Table 12-12 - Significance evaluation matrix for land contamination effects

			Risk Post-decommissioning (including embedded environmental measures)					
			Very Low	Low	Moderate / Low	Moderate	High	Very High
Risk pre-development	Existing receptors	Very High	**Major Positive (Significant)**	**Major Positive (Significant)**	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)
		High	**Major Positive (Significant)**	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)
		Moderate	Moderate Positive (Potentially Significant)	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)
		Moderate / Low	Moderate Positive (Potentially Significant)	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)
		Low	Minor Positive (Not Significant)	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	**Major Negative (Significant)**
		Very Low	Negligible (Not Significant)	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	Major Negative (Significant)	**Major Negative (Significant)**
	No receptor present pre-development	N/A	Minor Negative (Not Significant)	Moderate Negative (Potentially Significant)	Moderate Negative (Potentially Significant)	**Major Negative (Significant)**	**Major Negative (Significant)**	**Major Negative (Significant)**
	Risks that remain at moderate, high or very high post-development may require further measures during the construction phase to mitigate those risks depending on the specific circumstances (for example remediation in line with LCRM). Where effects are indicated to be Potentially Significant in EIA terms based on the change in risk from pre- to post-works, professional judgement will be applied in this ES to determine whether they are Significant or Not Significant.							

12.8 Assumptions and limitations

12.8.1. The regular environmental monitoring at the Site and including the Works Area, and the updated PQLRA in the 2024 Ground Truthing Report, provide assurance of the ongoing ground and groundwater conditions, although it is acknowledged by the Licensee that additional ground investigation, and potentially remediation, will be needed now that the HPB is entering decommissioning, and that previously unidentified contamination may be found once these investigations commence.

12.8.2. The decommissioning process will enable intrusive investigations in areas that have not been subject to ground investigation to date, e.g., due to operational safety constraints. The design of investigations will be informed by conditions encountered during decommissioning works, or the finding of surveys completed to inform decommissioning works. Areas of the Works Area that are outside the SPMP monitoring scope or other regular monitoring scopes (e.g., the closed landfill monitoring) will also need to be targeted for investigation. The current recommendations for additional ground investigation and environmental monitoring at specific APCs are presented in the 2024 Ground Truthing Report. Phased site characterisation and assessment of land contamination risks to update and implement the WMP and SWESC during the Proposed Works in accordance with LCRM is an embedded measure in **Table 12-7**.

12.9 Scope of the assessment

Study Area

12.9.1. The Study Area for the assessment is as defined in paragraphs 12.3.1 to 12.3.2. This extends to a 1 km buffer around the onshore areas of the Works Area.

12.9.2. The elements of the Proposed Works with potential to result in effects on soils, geology and hydrogeology and land contamination receptors will mainly occur during the Preparations for Quiescence phase, with some requirement for maintenance and monitoring during the Quiescence phase, and further works with potential to interact with soils, geology and hydrogeology and land contamination receptors occurring during the Final Site Clearance phase. The temporal scope of the assessment of soils, geology and hydrogeology is, therefore, consistent with the entire period over which the Proposed Works will be carried out i.e., it covers all phases of decommissioning up to the end of the Final Site Clearance (see **Chapter 2: The Decommissioning Process**).

Potential receptors

12.9.3. This section details the approach to identifying receptors that could be significantly affected by the Proposed Works and that have been taken forward for further consideration.

12.9.4. The land contamination receptors identified as having potential to be affected by the Proposed Works are as follows (the receptors are given an ‘R’ identifier which is also used in **Table 12-13**):

- Human health (current and future site users [R1], decommissioning workforce, and adjacent land users [R2] – includes public paths, fields, adjacent nuclear site users at HPA).
- Groundwater in made ground and superficial deposits (secondary [undifferentiated] aquifer in the beach and tidal flat deposits to the east and south [R3].
- Groundwater in the Lower Lias (bedrock secondary A aquifer) [R4].

- Surface water drainage ditches (rhynes), the nearest located approximately 50m southeast, running north to Bridgwater Bay, and surface water in ponds near the sewage works [R5].
- Coastal surface water in Bridgwater Bay [R6].
- Property: livestock and crops in fields east and south of the Site [R7], wild animals subject to commercial fishing in Bridgwater Bay and the Severn Estuary (fish and crustaceans), wild animals onshore (game) [R8], on and offsite current and future built environment [R9].
- Ecologically sensitive sites – Bridgwater Bay SSSI and National Nature Reserve (NNR), Severn Estuary SPA, SAC and Ramsar site, immediately north and northeast of the Works Area [R10].
- Sensitive area with hydrogeological connection to the Works Area – Wick Moor and North Moor GWDTE is offsite to the north and east beyond Hankley Brake woodland, at its closest point it is approximately 18m northeast of the Works Area. Due to the groundwater divide described in paragraph 12.5.28, some groundwater from the Works Area likely to flow to the GWDTE [R11].

12.9.5. The potential effects on the land contamination receptors described above, as a result of the Proposed Works, are detailed in **Table 12-13.**, There is the potential for land contamination receptors to be affected during the Preparations for Quiescence phase (due to this being the stage with greatest requirement for ground disturbance and works involving existing below ground infrastructure), then to a lesser extent during the Quiescence and Final Site Clearance phases.

Table 12-13 - Receptors subject to potential effects

Receptor	Reason for consideration
Human health (site users) [R1] **Human health (site users on HPA and HPB outside the Works Area) [R2]** **Human health (members of the public outside the Site) [R2]**	Potential for site users to be exposed to contaminants (by direct contact, inhalation, or ingestion of contaminants in soil, or inhalation of volatile contaminants migrating in or on groundwater). Potential for offsite migration of contaminants and offsite land users being exposed to contaminants in soil (by direct contact, inhalation, or ingestion, or inhalation of volatile contaminants migrating in or on groundwater).
Controlled waters: groundwater in made ground and superficial deposits (secondary [undifferentiated] aquifer in the beach and tidal flat deposits to the east and south [R3] **Controlled waters: groundwater in the Lower Lias (bedrock secondary A aquifer) [R4]**	Potential for the Proposed Works to result in changes to concentrations / presence of contaminants due to changes to existing hydrogeological conditions, or the introduction of new contaminants to groundwater during activities involving excavation dewatering / ground disturbance / physical changes to existing ground conditions.
Controlled waters: surface water drainage ditches (rhynes), the nearest located approximately 50m southeast, running north to Bridgwater Bay [R5] **Controlled waters: surface water in ponds near the sewage works [R5]**	Potential for the Proposed Works to result in changes to concentrations / presence of contaminants in surface water, either by surface run-off, migration in the subsurface or via groundwater, migration via preferential pathways, or direct discharge via drainage systems.

Receptor	Reason for consideration
Controlled waters: coastal surface water in Bridgwater Bay [R6]	Potential for the Proposed Works to result in changes to concentrations / presence of contaminants in surface water, either by surface run-off, migration in the subsurface or via groundwater, migration via preferential pathways, or direct discharge via drainage systems.
Property: livestock and crops in fields east and south of the Site [R7], wild animals subject to commercial fishing in Bridgwater Bay and the Severn Estuary (fish and crustaceans), wild animals onshore (game) [R8] **Property: on and offsite current and future buildings, including buried services) [R9]**	Potential for offsite migration of contaminants, or accidental offsite release (e.g., unauthorised drainage discharge), and subsequent damage to property.
Ecologically sensitive sites: Bridgwater Bay SSSI, National Nature Reserve, Severn Estuary SPA, SAC and Ramsar site) immediately north and northeast of the Works Area [R10]	Potential for offsite migration of contaminants in the subsurface, including in shallow groundwater, or via surface water drainage channels.
GWDTE: Wick Moor and North Moor GWDTE immediately north and east beyond Hankley Brake woodland [R11]	Potential for changes in the quantitative status of groundwater within the GWDTE due to dewatering activities on the Works Area.

Likely significant effects

12.9.6. The likely significant soils, geology and hydrogeology, including land contamination, effects that will be taken forward for assessment in the ES are summarised in **Table 12-14**.

12.9.7. The likely significant effects detailed in **Table 12-14** are applicable for all stages of the Proposed Works, however the highest potential for land contamination effects will occur during the Preparations for Quiescence phase (due to this being the stage with greatest requirement for ground investigation and works involving existing below ground infrastructure). There will still be potential for effects during the Quiescence and Final Site Clearance phases but to a lesser extent, as there will be less activity with the potential to result in the creation of new land contamination risks or to increase (or decrease) existing risk levels.

Table 12-14 - Likely significant soils, geology and hydrogeology effects

Activity (each activity is given an 'A' identifier which is used in the assessment in Section 12.11)	Likely significant effects	Receptor
A1: Land quality ground investigations (e.g. excavations/trial pits, groundwater monitoring well construction)	Contamination of soils and groundwater, deterioration in groundwater and surface water quality. ▪ Re-mobilisation /change in direction of contaminant plumes (including non-NAPL) due to groundwater abstraction from monitoring wells. ▪ Release of contaminants from soils or groundwater, or free phase hydrocarbons brought to the surface during ground investigation, potential migration to ground or water via surface water drainage. ▪ Monitoring wells left on site during demolition work could provide preferential pathways to the bedrock aquifer. ▪ Mobilisation of volatile contaminants beneath the surface, that may present an unacceptable risk to site users through inhalation (vapours/gases) or to offsite users by migration of volatile contaminant vapours from the Works Area.	▪ Human health – site users. ▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A2: Leaks/spills of fuels and oils from plant and storage tanks during construction work	Contamination of soils and groundwater, deterioration in groundwater and surface water quality.	▪ Human health – site users. ▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer.

		▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A3: Removal of foundations/ floor slabs, road surfaces	Potential to mobilise previously covered contaminated soils or contaminated fill materials, resulting in contamination of soils and groundwater, deterioration in groundwater and surface water quality. Mobilisation of volatile contaminants beneath the surface, that may present an unacceptable risk to site users through inhalation (vapours/gases) or to offsite users by migration of volatile contaminant vapours from the Works Area.	▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A4: Backfilling subsurface voids and reuse of site-derived materials, and residual contamination in subsurface structures	Introduction of fill materials with potential to leach contaminants. Mobilisation of existing contamination in soils resulting in leaching of contaminants to site groundwater which may migrate off site via shallow groundwater or through surface water drainage.	▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops.

		▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A5: Laydown and storage, including soil and material stockpiles	The mobilisation of existing contaminants from stockpiles may have an adverse impact on water quality. Potential to mobilise previously covered contaminated soils or contaminated fill materials, resulting in contamination of soils and groundwater, deterioration in groundwater and surface water quality.	▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A6: Removal of drains (active and non-active drainage)	Change in drainage (removal of existing drainage routes) potentially promoting contaminant run-off, ponding, or infiltration, resulting in deterioration in groundwater and surface water quality.	▪ Human health – site users. ▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals.

		▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A7: Pumping and dewatering schemes	Re-mobilisation or change in direction of contaminant plumes (including mobility of NAPL). The mobilisation of existing contamination within the soils can result in leaching of contaminants to site groundwater which may migrate off site via shallow groundwater or through surface water drainage. The mobilisation of off-site contamination may result in the migration of contamination onto the Works Area, posing an unacceptable risk to onsite controlled water receptors (groundwater and surface water). Decrease/increase or change in groundwater levels and flow direction promoting mobilisation of contaminants onto the Works Area. Decrease in groundwater levels, and changes in groundwater flows affecting offsite GWDTEs. The farmland east and south of the Works Area is wet meadow habitat, with SSSI status, potential change to quantitative status during dewatering.	▪ Human health – site users. ▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar. ▪ Ecologically sensitive sites: GWDTE.
A8: Drilling / core slab drilling	The mobilisation of existing contaminants may have an adverse impact on water quality.	▪ Human health – site users. ▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay.

		▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.
A9: Construction of sub-surface structures, concrete laying and movement of materials (general earthworks and ground preparation)	There may be a requirement to construct new below ground structures such as drains. This could potentially re-mobilise or change the direction of existing contaminant plumes (including mobility of NAPL) through creation of new migration pathways. The mobilisation of existing contamination within the soils could result in leaching of contaminants to site groundwater which may migrate off site via shallow groundwater or through surface water drainage. Mobilisation of volatile contaminants beneath the surface may present an unacceptable risk to site users through inhalation (vapours/gases). Migration of volatile contaminant vapours from the Works Area may also present a risk to offsite users.	▪ Human health – site users. ▪ Human health – offsite land users including on HPA and HPB outside the Works Area, the public outside the Site. ▪ Groundwater – in made ground, superficial deposits, and Lower Lias secondary A aquifer. ▪ Surface water – (freshwater) drainage channels (rhynes) and ponds. ▪ Surface water – (coastal) Bridgwater Bay. ▪ Property – livestock and crops. ▪ Property – wild animals. ▪ Property – current and future built environment. ▪ Ecologically sensitive sites: SSSI, NNR, SPA, SAC, Ramsar.

12.10 Receptors and effects scoped out of the assessment

12.10.1. A number of potential effects have been scoped out from further assessment, resulting from a conclusion of no likely significant effect. These conclusions have been made based on the knowledge of the baseline environment, the nature of the Proposed Works and the evidence available on the potential for impact from similar projects more widely.

- Effects on geology are scoped out as there are no geological Sites of Special Scientific Interest (SSSIs), Regionally Important Geological or Geomorphological Sites (RIGs) or Locally Important Geological Sites (LIGs) within the Works Area, the Site or in the wider Study Area (1 km from the Works Area).

- Regarding land contamination, potentially significant effects on construction workers have been scoped out of the assessment as construction workers will be subject to the CDM Regulations 2015 and the Health and Safety at Work Act (1974) and regulations made under the Act. These legal obligations include the requirement for risk assessments and method statements for all construction related activities and the use of appropriate working methods, training and Personal Protective Equipment (PPE). Standard construction practices will also incorporate the radiological principles of managing risks to as low as reasonably practicable (ALARP) will be applied.
- Effects on the local or national agricultural land resource (including best and most versatile land), and associated soil resources and soil functions, are scoped out on the basis that the agricultural land surrounding the Site is not likely to be best and most versatile land based on the published provisional ALC grade (the land is shown mainly as Grade 4), the agricultural land is separated from most of the Works Area by the woodland at Hankley Brake, and there will be no physical disturbance to the agricultural soils at Wick Moor or North Moor, as a result of the Proposed Works. However, property receptors (including agricultural crops or livestock, and ecological receptors) are included in the assessment as potential land contamination receptors.
- Effects on soil receptors in terms of soil functions and the local or national soil resource, including topsoil within the woodland on the Site immediately east of the Works Area, and soils within designated nature conservation areas are also scoped out. This is based on most of the naturally occurring topsoil within the Works Areas having been removed, covered or otherwise damaged during the construction of HPB, and most of the Works Area being currently covered in gravel and tarmac, concrete or hardstanding and used for industrial purposes, which will continue to be the case until the release of the Site from the RSR.
- Permanent effects on hydrogeology such as changes to rainfall infiltration, changes to groundwater levels or the hydrogeological flow regime, as a result of the Proposed Works, are scoped out of the assessment in relation to groundwater resources on the basis that the groundwater is coastal, no principal aquifers are present on the Works Area or in the Study Area, and the local groundwater is not currently exploited resource (for potable water supply or commercial uses) and taking into consideration the baseline conditions and the nature of the Proposed Works. Given the established use of the Works Area and the wider Site for nuclear power generation, it is unlikely that groundwater beneath the Works Area or the Site will be exploited as a groundwater resource in the future. Groundwater is considered as a potential land contamination receptor in the assessment, and the potential for dewatering to result in drawdown of groundwater and subsequent mobilisation of existing land contamination is considered in the assessment. The potential effects of dewatering during the Preparations for Quiescence and Final Site Clearance on the offsite GWDTE are also considered in the assessment in terms of the potential for dewatering to result in quantitative effects on the offsite GWDTE.
- Changes to the hydrogeological regime as a result of climate change effects and subsequent changes to contaminant migration and effects on land contamination receptors are scoped out as these will be taken into account in the assessment in relation to phased land contamination risk assessment in accordance with LCRM (see **Table 12-7**)**.**
- Effects associated with flood risk are considered in **Chapter 11: Surface Water and Flood Risk**.

- Effects on land contamination receptors associated with the handling, storage and disposal of radioactive contaminants of concern during the Proposed Works during defueling and active area deplanting and deconstruction (as described in **Chapter 2: The Decommissioning Process**) are considered in **Chapter 20: Radioactive Waste and Discharges**. This is on the grounds that these radioactive contaminants are covered by the rigorous requirements of the nuclear licencing regime for the decommissioning of nuclear sites as defined in the Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation Version 1.0: July 2018.
- Interactions between soil geology and hydrogeology receptors (including land contamination receptors) and radiological sources are scoped out, as these will be assessed under the nuclear licensing regime.

12.11 Assessment of effects

12.11.1. This section assesses the likely significant effects of the Proposed Works on hydrogeology, and land contamination receptors. Effects on geology, soil resources (natural in-situ soils including agricultural land and woodland soils), and permanent effects on hydrogeology are scoped out as detailed in **Section 12.10**.

12.11.2. The identified likely significant effects (see **Table 12-14**) could occur at the Preparations for Quiescence, Quiescence or Final Site Clearance phases, however, there will be the greatest potential for land contamination effects to occur during the Preparations for Quiescence phase. This is because it will involve the most ground disturbance and deconstruction activity. During the Quiescence and Final Site Clearance phases there will be less activity with the greatest potential to result in the creation of new land contamination risks or to increase (or decrease) existing risk levels. The assessments below, therefore, refer to the Preparations for Quiescence phase to provide a worst-case scenario.

A1[49]: Land quality ground investigations

12.11.3. The Works Area has been subject to numerous previous ground investigations to assess the land quality, regular groundwater monitoring and surface water monitoring takes place as part of the SPMP, and regular reviews of land quality risks are undertaken through updates of the Land Quality Register (LQR) and Preliminary Qualitative Risk Assessment (PQLRA) for HPB, including all of the Works Area. During the Preparations for Quiescence phase, and as required in the later phases of the Proposed Works, it will be necessary to undertake ground investigations to confirm the land quality and inform the design of further ground works or any remediation measures required prior to the surrendering of permits/ waste management licences or de-licensing of the Site.

[49] See **Table 12-14** for full description of effects.

12.11.4. Ground investigation will necessitate disturbance of some ground that has not previously been investigated and this is likely to involve machine excavation of pits and borehole advancement / borehole drilling. This will produce arisings that will need to be temporarily stored at surface, and some contaminated liquids (during ground investigation these are likely to be relatively small in scale, however a larger investigation could generate several cubic metres of excavated soils and / or wastewater), which could then pose a pollution risk and have potential to affect land contamination receptors. Drilling of, and construction of groundwater monitoring wells, also has the potential to mobilise contaminants e.g., if monitoring wells introduce a new linkage e.g., between two separate aquifers, or if redundant wells are left in an area where demolition is occurring (headworks can become damaged by demolition plant and vehicles allowing contaminants present at surface to enter the well and reach groundwater.

12.11.5. Identified potential receptors include human health (site users, offsite land users), groundwater in made ground and offsite superficial aquifer, groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing, the built environment).

12.11.6. Ground investigation is an established process within the Works Area and the Site and will be subject to compliance with the Licensee's environmental management system and systems for the control of works, however, the larger scale and likely increased frequency of investigation needed during the Proposed Works, and the physical changes to the Site required for the Proposed Works may increase the potential for ground investigation works to result in new pathways for contaminant migration.

12.11.7. With regard to volatile contaminants, no contamination by volatile organic compounds (VOCs) or ground gas with the potential to significantly impact on human health or property receptors has been identified to date. However, the 2024 Ground Truthing Report identifies the need to include testing for VOCs in future groundwater monitoring at some medium and high-risk APCs, and the risk assessment will be updated accordingly once data is available. The embedded measures that will inform the design and implementation of ground investigations to confirm that these risks are not present include M12.2, M12.3 and M12.11.

12.11.8. In relation to PFAS, which the 2024 Ground Truthing Report identifies as contaminants that should be included in future environmental testing suites, these are extremely persistent emerging contaminants, with evolving regulation, which are widely present in surface waters and groundwaters in England. Fire-fighting foams are an important source of PFAS, not least because they have typically been held in bulk quantities on sites with their own fire suppression systems and have been sprayed to ground during fire training or fire events. It is likely that new Environment Agency and industry guidance for the investigation and assessment of PFAS will emerge during the Proposed Works and this will be kept under review as updates of the LQR are undertaken PQLRA, and in the planning and interpretation of investigation or environmental monitoring concerning PFAS for the Proposed Works.

12.11.9. The main embedded measures (see **Table 12-7**) that will inform the design and implementation of ground investigations to avoid the release of contaminants due to ground investigation works include M12.2, M12.3 and M12.11 (phased approach to investigation and monitoring and effective management of land condition data), M12.5 and M12.6 (preventing new wells or existing groundwater monitoring wells from acting as preferential contaminant migration pathways), M12.7, M12.8 and M12.9 (general pollution prevention), M12.15 (in relation to control of asbestos fibres or asbestos-containing materials [ACMs] where these may be present in the ground), and M12.16 (dewatering assessments). Ground investigation activity will increase understanding of the ground conditions on the Site and is essential to inform the management and lowering of risks associated with other activity during the Proposed Works.

12.11.10. Whilst the probability of encountering contamination during the Proposed Works increases by the act of disturbing / exposing contaminants in soils or groundwater, the result of the embedded environmental measures is that the probability of a pollutant linkage being created is reduced. As such, the overall 'likelihood' with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible**, and **Not Significant**.

A2[49]: Leaks/spills of fuels and oils from plant and storage tanks during construction work

12.11.11. During the de-planting and demolition activities during the Preparations for Quiescence phase, and to a lesser extent in later phases of the Proposed Works, vehicles, mobile plant and machinery will be brought onto the Works Area to carry out the required activities. Although in some instances electric powered plant or vehicles can be used, it is unlikely that all vehicles, plant and machinery will avoid the use of liquid fuels and oils (e.g., hydraulic oils) in the Works Area during the Proposed Works, and the extent of these works and timescales means that the use of such items is likely to increase above the baseline situation.

12.11.12. Land contamination receptors with potential to be affected include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, and the built environment).

12.11.13. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for leakages to ground or into drains to result in contaminants migrating in groundwater and/or reaching the rhynes [R6].

12.11.14. The implementation of the embedded measures will reduce the likelihood of a release occurring. These include good practice for pollution prevention such as use of bunds, locating tanks away from drains and permeable areas, controlling filling activities and the use of spill kits (M12.7 and M12.8), monitoring for changes in groundwater or surface water quality during the Proposed Works, drainage planning for the Proposed Works (M12.1), and preventing new wells or existing groundwater monitoring wells from acting as preferential contaminant migration pathways (M12.5 and M12.6). These will lower the likelihood of a pollution incident taking place and reduce the potential scale of the

impact. If a minor spillage or leakage incident did occur to ground, actions would be taken to assess the impact of the release and undertake clean up if needed.

12.11.15. As such, the overall 'likelihood' with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible**, and **Not Significant** in EIA terms.

A3[49]: Removal of foundations/ floor slabs, road surfaces

12.11.16. During the Preparations for Quiescence phase, and as required in the later phases of the Proposed Works, changes to the current ground surfacing may be needed to enable the Proposed Works.

12.11.17. The removal of some hard surfaces will expose areas of ground that have not previously been investigated and which in some instances may be contaminated. Additionally, the removal of hard surfaces can result in the creation of new contaminant migration pathways for contaminants to migrate in liquid or gaseous form, or as dust. Increased infiltration of rainwater due to removal of hard surfacing could mobilise existing contaminants in soils through leaching or migration and could mobilise existing contaminant plumes in groundwater.

12.11.18. With regard to volatile contaminants, no contamination by VOCs or ground gas with the potential to significantly impact on human health or property receptors has been identified to date. However, the 2024 Ground Truthing Report identifies the need to include testing for VOCs in future groundwater monitoring at some medium and high-risk APCs, and the risk assessment will be updated accordingly once data is available. This testing will be undertaken prior to the removal of foundations/ floor slabs/ road surfaces in order that the presence/ absence and concentrations of VOCs is understood at the relevant APCs before new migration pathways are potentially introduced.

12.11.19. Land contamination receptors with potential to be affected include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing, and the built environment).

12.11.20. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for mobilisation of contaminants in groundwater and migration into the rhynes [R6].

12.11.21. The embedded measures that will inform risk assessments for potential new risks or changes to the level of risk to receptors due to changes to existing surface cover include M12.1 (drainage planning for the Proposed Works), M12.2 and M12.3 (phased approach to investigation and monitoring and effective management of land condition data) and M12.11 (land condition data management and presentation to inform the design of the Proposed Works).

12.11.22. With the implementation of the embedded measures, appropriate characterisation, risk assessment, and if necessary, remediation, will be completed to ensure that the overall 'likelihood' of a pollutant linkage being created with the Proposed Works remains unchanged from that in the baseline, or is reduced through remediation. Therefore, the risks to the potential land contamination receptors from

the Proposed Works will remain unchanged from the baseline (or will be lower) and, therefore, the worst-case effect is **Negligible** and **Not Significant**.

A4[49]: Backfilling subsurface voids and reuse of site-derived materials, and residual contamination in subsurface structures

12.11.23. During the Preparations for Quiescence phase there will be a requirement to backfill subsurface voids arising from the Proposed Works. Potential for this to be needed during the Final Site Clearance is also not ruled out. Some subsurface structure or drains may be retained on site permanently and following defueling and deplanting there is the potential for these to contain residual contamination.

12.11.24. Without adequate assessment and controls, there could be potential for site-won excavated materials or demolition materials used to backfill subsurface voids to create new contamination sources and pathways (e.g., crushed concrete in contact with rainfall or groundwater can result in highly alkaline leachate), or for residual contamination in subsurface structures to present a future land contamination risk.

12.11.25. Land contamination receptors with potential to be affected include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, and the built environment).

12.11.26. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for groundwater impact and groundwater migration into the rhynes [R6].

12.11.27. The licensee has ground investigation data for the Site and where subsurface structures are known or suspected to contain residual contamination (radiological and / or non-radiological), suitable additional investigation work will be undertaken to characterise material that may be exposed, or is exposed, during the Proposed Works to enable risk assessment to be undertaken to demonstrate that the material does not pose a significant risk to receptors or that it requires further remedial action. The licensee complies with the conditions of the RSR permit in relation to maintaining the SWESC, which necessitates a thorough understanding of the land quality at the Site, and the WMP, which requires control by the Licensee over all forms of radioactive wastes. The content of both documents must interact and must be regularly updated as the licensee's understanding of the land condition and the wastes likely to arise from site activities continues to evolve.

12.11.28. The embedded measures to ensure adequate assessment and verification of the suitability for use of materials used for backfilling, taking into consideration potential residual contamination within structures, are M12.1 (drainage planning for the Proposed Works), M12.2 (compliance with LC34 and GRR), M12.3 (maintaining the SWESC and WMP as live documents) and M12.4 (phased approach to investigation and monitoring and effective management of land condition data, including consideration of climate change in long-term risk assessment), M12.10 (measure confirming risk assessment to determine 'suitable for use' criteria for backfill materials), M12.11 (land condition data management and presentation to inform the design of the Proposed Works), and M12.12 (materials management planning and verification of reused materials to demonstrate suitability for use and placement in accordance with an agreed plan). In addition, the backfilling of larger scale voids is likely to entail the Licensee obtaining an Environmental Permit for the activity. If a new permit or permits are needed

these will include specific conditions for the protection of soil and groundwater, which will be complied with by the licensee.

12.11.29. With the implementation of the embedded measures the overall 'likelihood' of a pollutant linkage being created with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will not result in a significant increase from the baseline and, therefore, the effect is **Negligible**, which is **Not Significant**.

A5[49]: Laydown and storage, including soil and material stockpiles

12.11.30. During the Preparations for Quiescence phase demolition materials will be generated by the Proposed Works and will need temporary storage, potentially as stockpiles or in skips / other containers prior to re-use on-site or exportation from site. Similar activities are likely to take place during the Final Site Clearance.

12.11.31. Stockpiling of demolition material will require the handling and stockpiling of materials which have potential to release contaminants as dust or via runoff / leaching, or by placement of materials onto previously uncontaminated ground surfaces.

12.11.32. Land contamination receptors with potential to be affected include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, and the built environment).

12.11.33. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for groundwater impact or entry of contaminants into drains, resulting in contaminants migrating in groundwater and/or reaching the rhynes [R6].

12.11.34. The embedded measures that will contribute to the careful management of material in stockpiles and lower risks to the environment are: M12.1 (drainage planning for the Proposed Works), M12.2 and M12.3 (phased approach to investigation and monitoring and effective management of land condition data), M12.10 (measure confirming risk assessment to determine 'suitable for use' criteria for backfill materials being temporarily stored), M12.11 (land condition data management and presentation to inform the design of the Proposed Works), and M12.12 (materials management planning and verification of reused materials to demonstrate suitability for use and placement in accordance with an agreed plan).

12.11.35. With the implementation of the embedded environmental measures, the overall 'likelihood' of a pollutant linkage being created with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible** and **Not Significant**.

A6[49]: Removal of drains (active and non-active drainage)

12.11.36. Existing drains are largely to be retained for the Quiescence phase, however, during the Preparations for Quiescence phase, it is likely that some existing drains will need to be decommissioned and potentially removed or capped. Changes to drainage systems may also be needed later in the Proposed Works, such as during maintenance for the Quiescence phase and during the Final Site Clearance.

12.11.37. Land contamination receptors with potential to be impacted by drainage works (and contaminants that may be released from drains) include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, and the built environment).

12.11.38. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for groundwater impact and contaminants migrating in groundwater and reaching the rhynes [R6].

12.11.39. The key embedded measures (See **Table 12-7**) to lower the risk of contaminants present in drainage systems causing an impact to environmental receptors during changes to the existing drainage systems are M12.1 (drainage planning for the Proposed Works), M12.2 and M12.3 (phased approach to investigation and monitoring and effective management of land condition data), M12.11 (land condition data management and presentation to inform the design of the Proposed Works).

12.11.40. With implementation of the embedded measures, the overall 'likelihood' of a pollutant linkage being realised with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible** and **Not Significant**.

A7[49]: Pumping and dewatering schemes

12.11.41. During the Preparations for Quiescence phase excavations will be needed, and due to the shallow water table in the Works Area, dewatering of excavations is likely to be required. Similar activities are likely to take place during the Final Site Clearance.

12.11.42. Dewatering during the Proposed Works will be subject to prior assessment to lower the risk of contaminant mobilisation as a result of dewatering. Where excavations are needed, the likely requirement for dewatering will be assessed as required, to enable suitable mitigation measures to be adopted during any dewatering activity to minimise potential for contaminant migration, ensure compliance with water environment legislation in relation to discharges, and protect the offsite GWDTE.

12.11.43. Land contamination receptors with potential to be affected include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, the built environment).

12.11.44. In addition, the Works Area is only 18 m from the Bridgwater Bay SSSI which is classed by the Environment Agency as a GWDTE. Dewatering activities on the Works Area would have the potential to alter flows of groundwater from the Works Area to the GWDTE.

12.11.45. The embedded measures (see **Table 12-7**) to minimise the environmental risks associated with dewatering are M12.1 (drainage planning for the Proposed Works), M12.2 and M12.3 (phased

approach to investigation and monitoring and effective management of land condition data), M12.11 (land condition data management and presentation to inform the design of the Proposed Works), and M12.16 (measure to confirm adequate risk assessment will be undertaken prior to dewatering to be protective of land contamination receptors and the offsite GWDTE). No quantitative assessment has been undertaken to date, however, the embedded measures ensure that further qualitative assessment, and quantitative assessment if needed, will be undertaken as required, if dewatering of excavations is to be undertaken within the Works Area.

12.11.46. With implementation of the embedded environmental measures, the overall 'likelihood' of a pollutant linkage being realised with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible** and **Not Significant**. In relation to potential effects on the flows of groundwater to the GWDTE at Wick Moor, a dewatering assessment will be completed in advance of undertaking dewatering, this should result in a **Negligible** impact on the GWDTE, and the effect is **Not Significant**.

A8[49]: Core slab drilling

12.11.47. During the Preparations for Quiescence phase existing hard surfaces may need to be drilled through, potential for this during Final Site Clearance is not ruled out.

12.11.48. Drilling through existing hard / impermeable structure has the potential to create new pathways for contaminants to migrate vertically downwards to reach the water table, where they may subsequently migrate via groundwater flow to surface waters. Potential for changes to the ground surface to result in increased rainwater infiltration and leaching of contaminants is considered as effect A3.

12.11.49. Land contamination receptors with potential to be affected include human health (site users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, and the built environment).

12.11.50. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for mobilisation of contaminants in groundwater and migration into the rhynes [R6].

12.11.51. Embedded measures to ensure that adequate planning and management of drilling works is undertaken to limit the potential for pollution incidents measures include: M12.1 (drainage planning for the Proposed Works), M12.2 and M12.3 (phased approach to investigation and monitoring and effective management of land condition data), M12.5 and M12.6 (preventing new wells or existing groundwater monitoring wells from acting as preferential contaminant migration pathways), and M12.7 and M12.8 (general pollution prevention).

12.11.52. With implementation of the embedded measures, the overall 'likelihood' of a pollutant linkage being realised with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible** and **Not Significant**.

A9[49]: Construction of sub-surface structures

12.11.53. During the Preparations for Quiescence phase ground works may include the construction of new sub-surface structures (such as new drainage connections or changes to existing drainage) and the creation of new buildings / hard surfaced areas. Similar activities are likely to take place during the Final Site Clearance.

12.11.54. Construction of new below ground structures such as drains could affect pre-existing contamination by changing the local hydrogeological regime and mobilising pre-existing contaminants if new contaminant migration pathways are created.

12.11.55. Land contamination receptors with potential to be impacted by changes in the subsurface include human health (site users, offsite land users), groundwater in the weathered and unweathered Lower Lias Formation, groundwater in the offsite superficial aquifer to the east and south, surface water in the rhynes, surface water in Bridgwater Bay, ecological systems including Bridgwater Bay SSSI (includes fields to the east and south, and the estuary) and designations applying to the estuary (Severn Estuary SPA, SAC, Ramsar site, and Somerset Wetlands National Nature Reserve), and property (crops / livestock on agricultural fields, wild animals subject to commercial fishing or shooting, and the built environment).

12.11.56. The sensitive receptors at highest risk of an impact occurring are groundwater [R3 & R4] and surface water, due to the potential for groundwater impact and contaminants migrating in groundwater and reaching the rhynes [R6].

12.11.57. This activity is most likely to take place once further ground characterisation has been completed, and the design of sub-surface structures will be informed by the latest understanding of the ground conditions. The embedded measures (See **Table 12-7**) that will avoid or lower the potential for the Proposed Works to result in the mobilisation of pre-existing contaminants are M12.1 (drainage planning for the Proposed Works), M12.2 and M12.3 (phased approach to investigation and monitoring and effective management of land condition data), M12.5 and M12.6 (preventing new wells or existing groundwater monitoring wells from acting as preferential contaminant migration pathways), and M12.12 (in relation to reuse of materials in backfilling and confirming their suitability for use).

12.11.58. With implementation of the embedded measures, the overall 'likelihood' of a **pollutant** linkage being realised with the Proposed Works remains unchanged from that in the baseline. Therefore, the risks to the potential land contamination receptors from the Proposed Works will remain unchanged from the baseline and, therefore, the effect is **Negligible** and **Not Significant**.

12.12 Assessment of cumulative effects

Inter-Project effects

12.12.1. There is the potential for soils, geology and hydrogeology effects associated with the Proposed Works to interact with or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

12.12.2. An assessment of inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-Project effects

12.12.3. A summary of the potential intra-project effects is provided in **Chapter 21: Cumulative Effects Assessment.**

12.13 Summary

Phase of proposed works where effects may occur	Summary of predicted effect	Receptors potentially affected (see Table 12-13)	Magnitude of Change (change in risk level as evaluated using the criteria in Table 12-12)	Significance (see criteria in Table 12-12)	Summary of rationale
Preparations for Quiescence, also Quiescence and Final Site Clearance	A1: Land quality ground investigations (e.g. excavations/trial pits, groundwater monitoring well construction / decommissioning)	R1 to R10	Negligible	Not Significant	Embedded measures that will inform the design and implementation of ground investigations to avoid the release of contaminants due to ground investigation works include 12.2, 12.3, 12.5, 12.6, 12.7, 12.8, 12.9, 12.11, 12.15 and 12.16.
Preparations for Quiescence, also Quiescence and Final Site Clearance	A2: Leaks/spills of fuels and oils from plant and storage tanks during construction work	R1 to R10	Negligible	Not Significant	Embedded measures to reduce the likelihood of a release occurring and to monitor for any changes in groundwater or surface water quality during the Proposed Works include: 12.1, 12.2, 12.5, 12.6, 12.7 and 12.8.

Phase of proposed works where effects may occur	Summary of predicted effect	Receptors potentially affected (see Table 12-13)	Magnitude of Change (change in risk level as evaluated using the criteria in Table 12-12)	Significance (see criteria in Table 12-12)	Summary of rationale
Preparations for Quiescence, Final Site Clearance	A3: Removal of foundations/ floor slabs, road surfaces	R1 to R10	Negligible	Not Significant	Embedded measures that will inform risk assessments for potential new risks or changes to the level of risk to receptors due to changes to existing surface cover include 12.1, 12.2, 12.3, and 12.11.
Preparations for Quiescence, Final Site Clearance	A4: Backfilling subsurface voids and reuse of site-derived materials, and residual contamination in subsurface structures	R1 to R10	Negligible	Not Significant	Embedded measures to ensure adequate assessment and verification of the suitability for use of materials used for backfilling, taking into consideration potential residual contamination within structures, are 12.1, 12.2, 12.3, 12.4, 12.10, and 12.12.

Phase of proposed works where effects may occur	Summary of predicted effect	Receptors potentially affected (see Table 12-13)	Magnitude of Change (change in risk level as evaluated using the criteria in Table 12-12)	Significance (see criteria in Table 12-12)	Summary of rationale
Preparations for Quiescence, also Quiescence and Final Site Clearance	A5: Laydown and storage, including soil and material stockpiles	R1 to R10	Negligible	Not Significant	Embedded measures that will contribute to the careful management of material in stockpiles and lower risks to the environment are: 12.1, 12.2, 12.3, 12.10, 12.11, and 12.12.
Preparations for Quiescence, Final Site Clearance	A6: Removal of drains (active and non-active drainage)	R1 to R10	Negligible	Not Significant	Embedded measures to lower the risk of contaminants present in drainage systems causing an impact to environmental receptors during changes to the existing drainage systems are 12.1, 12.2, 12.3, and 12.11.

Phase of proposed works where effects may occur	Summary of predicted effect	Receptors potentially affected (see Table 12-13)	Magnitude of Change (change in risk level as evaluated using the criteria in Table 12-12)	Significance (see criteria in Table 12-12)	Summary of rationale
Preparations for Quiescence, Final Site Clearance	A7: Pumping and dewatering schemes	R1 to R10, R11	Negligible	Not Significant	Embedded measures to minimise the environmental risks associated with dewatering both in relation to are 12.1, 12.2, 12.3, 12.11, and 12.16.
Preparations for Quiescence, also Quiescence and Final Site Clearance	A8: Core slab drilling	R1 to R10	Negligible	Not Significant	Embedded measures to ensure that adequate planning and management of drilling works is undertaken to limit the potential for pollution incidents measures include 12.1, 12.2, 12.3, 12.5, 12.6, 12.7 and 12.8.
Preparations for Quiescence, also Quiescence and Final Site Clearance	A9: Construction of sub-surface structures	R1 to R10	Negligible	Not Significant	Embedded measures that will avoid or lower the potential for the Proposed Works to result in the mobilisation of pre-existing contaminants are 12.1, 12.2, 12.3, 12.5, 12.6, and 12.12.

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13

Historic Environment

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13 Historic Environment

13.1 Introduction

13.1.1. This chapter presents the assessment of the likely significant effects of the Proposed Works with respect to the historic environment. It describes the key receptors in the vicinity of the Indicative Dismantling Works Area (hereafter the 'Works Area'), inclusive of the Hinkley Point B (HPB) Nuclear Site Licence Boundary (hereafter referred to as the 'Site') and considers the sensitivity of these receptors.

13.1.2. This chapter should be read in conjunction with the description of the Proposed Works as presented in **Chapter 2: The Decommissioning Process**, and **Chapter 14: Landscape and Visual Impact Assessment (LVIA).**

13.1.3. This chapter is supported by the following figures provided in Volume II of this ES:

- **Figure 13.1** – Designated Asset Data Supplied by Historic England 2024, 5km Study Area
- **Figure 13.2** – HER data supplied by Somerset Historic Environment Record 2024, 1km Study Area

13.1.4. This chapter is supported by the following appendices provided in Volume III of this ES:

- **Appendix 13A: Historic Environment Survey Report**
- **Appendix 13B: Designated Heritage Assets**
- **Appendix 13C: Non-designated heritage records and previous investigations ('events')**

13.2 Relevant legislation, policy, and technical guidance

Legislation

13.2.1. The legislation presented in **Table 13-1** is relevant to the assessment of the effects on historic environment receptors.

Table 13-1 – Legislation relevant to historic environment

Legislation	Legislation Issue
Planning (Listed Buildings and Conservation Areas) Act 1990[1]	This Act covers the registration of Listed Buildings (buildings that are seen to be of special architectural or historic interest) and the designation of Conservation Areas (areas of special architectural or historic interest the character or appearance of which is desirable to preserve or enhance).
Ancient Monuments and Archaeological Areas Act 1979[2]	This Act sets out that sites considered to be of national importance are required to be compiled in a Schedule of Monuments. These sites are accorded statutory protection. Scheduled Monument Consent is required before any works are carried out which would have the effect of demolishing, destroying, damaging, removing, repairing, altering, adding to, flooding, or

[1] UK Government (1990). *Planning (Listed Buildings and Conservation Areas) Act 1990*. (Online) Available at: http://www.legislation.gov.uk/ukpga/1990/9/contents (Accessed August 2024)

[2] UK Government (1979). *Ancient Monuments and Archaeological Areas Act 1979.* (Online) Available at: https://www.legislation.gov.uk/ukpga/1979/46 (Accessed August 2024).

Legislation	Legislation Issue
	covering up a Scheduled Ancient Monument. Scheduled monument protection is offered not only to the known structures and remains of a site but also to the soil under and around them to protect any archaeological interest. This Act also provided for the designation of Areas of Archaeological Interest in which statutory provisions for access to construction sites for carrying out archaeological works apply.

Policy

13.2.2. National and local planning policies set out the requirements for the treatment of the Historic Environment at the national and local governmental level. In the case of this assessment, they refer to requirements with respect to the avoidance of direct disturbance of archaeological remains and historic buildings, or adequate mitigation measures where this is not possible. In addition, the requirements note the importance of avoiding significant adverse effects on designated assets where possible. This is in the case of both direct disturbance effects and through compromising the integrity of their setting.

13.2.3. A summary of the relevant policies is given in **Table 13-2**.

Table 13-2 – Policy relevant to historic environment

Policy Reference	Policy Relevance
National Policy	
National Planning Policy Framework (NPPF) (2023)[3]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the assessment of the Proposed Works. Paragraph 200 states the applicant should describe the significance of any heritage assets affected, including any contribution made by their setting. Paragraph 201 requires LPAs to assess the significance of heritage assets (and their setting) that may be affected, to avoid or minimise any conflict between the heritage asset's conservation and any aspect of the proposal. Paragraph 205 outlines that great weight will be given to the conservation of designated heritage assets "*…irrespective of whether any potential harm amounts to substantial harm, total loss or less than substantial harm to its significance*." Paragraph 206 outlines that any harm, or loss of significance of a designated heritage asset from development within its setting will require clear and convincing justification.

[3] Department for Levelling Up, Housing & Communities, 2023. National Planning Policy Framework https://www.gov.uk/government/publications/national-planning-policy-framework--2 (Accessed August 2024)

Policy Reference	Policy Relevance
	Paragraph 208 states "*Where development will lead to less than substantial harm to the significance of the designated asset, the harm should be weighed against the public benefit of the proposal*." The Works Area lies within the setting of numerous designated heritage assets. Designated assets will be scoped in for further assessment, where there is the potential to harm to their significance. Paragraph 209 states that "*The effect of a proposal on the significance of a non-designated heritage asset should be taken into account in determining the application.*" Paragraph 211 indicates that the Applicant will be required *"to record and advance understanding of the significance of any heritage assets to be lost (wholly or in part) in a manner proportionate to their importance and the impact, and to make this evidence (and any archive generated) publicly accessible.*" Paragraph 212 indicates that proposals which preserve those elements of the setting that make a positive contribution to an asset's significance should be treated favourably.
Local Policy	
Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) (2020)[4]	Objective 5.7.4 states that the historic environment "*should be protected from unauthorised demolition, alteration or extension because of its cultural significance, special architectural features or historic interest*." Policies proposed to meet this objective include: Policy 7b/6: "*Avoid harm to sustain and enhance the significance of heritage assets and their setting. Require information to understand the significance of the heritage asset and sympathetic design*"; and Policy 7b/11: "*Require evaluation of the archaeological value of sites where development affects a site of archaeological importance or an Area of High Archaeological Potentia*l." As stated in **Chapter 3: Policy and Legislation Overview** Somerset West and Taunton Council (SWT) are no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council.

[4] Somerset West and Taunton Council (2020). Somerset West and Taunton Local Plan 2040 Issues and Options Document (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/somerset-local-plan/somerset-west-and-taunton-local-plan-2040-review/ (Accessed August 2024).

Policy Reference	Policy Relevance
Adopted West Somerset Local Plan to 2032 (2016)[5]	Policy NH1 states that "*Planning decisions will have regard to the contribution heritage assets can have to the delivery of wider social, cultural, economic and environmental objectives*." Policy NH2 has two aspects of relevance, as follows: A. This policy requires sufficient information to be gathered on a heritage asset to allow assessment of potential impacts on its significance to be made. E. Requires recording of existing buildings regarded as having heritage significance which are planned to be demolished.
Sedgemoor Local Plan 2011-2032 (2019)[6]	Policy D26 states, "*Development proposals should avoid harm to sustain and, where appropriate enhance the significance of heritage assets and their setting (including those on Local Lists), in a manner consistent with their historical significance*. *…The Council will require development proposals affecting heritage assets or their setting to be supported by sufficient information (proportionate to the assets importance) to understand the significance of the heritage asset and how it will be potentially affected. This should have appropriate regard to the Somerset Historic Environment Record. Development proposals affecting heritage assets or their settings will be expected to exhibit appropriately sympathetic design in terms of siting, mass, scale, and use of materials…* *…The weight given to the conservation of non-designated heritage assets during the determination of the planning applications will be based on the asset's significance and the magnitude of any harm. Harm or loss will only be permitted where it is judged that the benefits of the development outweigh the local significance of the asset and the scale of harm caused."*

[5] West Somerset Council (2016), Adopted West Somerset Local Plan to 2032. (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton (Accessed August 2024).

[6] Sedgemoor District Council (2019). Sedgemoor Local Plan (2011-2032) (online). Available at: https://www.sedgemoor.gov.uk/media/6202/Sedgemoor-Local-Plan-2011-2032-Adoption-Version/pdf/Local_Plan_2011-2032_-_Adoption_Version.pdf?m=636887820984770000 (Accessed January 2024).

Technical guidance

13.2.4. A summary of the relevant technical guidance informing this chapter is given in **Table 13-3**.

Table 13-3 – Technical guidance relevant to historic environment

Technical Guidance	Context
Managing Significance in Decision-Taking in the Historic Environment, Historic Environment Good Practice Advice in Planning: 2 (2015)[7]	Provides information on good practice in assessing the significance of heritage assets.
The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning: 3 (2nd Edition) (2017)[8]	Sets out guidance on managing change within the settings of heritage assets.
England's Redundant Post-War Coal- and Oil-Fired Power Stations: Guidelines for Recording and Archiving Their Records (2016)[9]	Sets out advice to the Energy Industry on the appropriate and proportionate level of recording of redundant power plants for posterity. To the applicant's knowledge, there is no specific guidance to nuclear power stations and whilst this guidance is specific to coal and oil-fired power stations, it is considered relevant to nuclear power stations as well.
Standard and guidance for the archaeological investigation and recording of standing buildings or structures[10]	Sets out standards for archaeological building investigation and recording to establish the character, history, dating, form and archaeological development of a specified building, structure, or complex and its setting.
Standard and guidance for commissioning work or providing consultancy advice on archaeology and the Historic Environment[11]	Sets out standards for the provision of consultancy advice in the Historic Environment.

7 HE (2015). *Managing Significance in Decision-Taking in the Historic Environment, Historic Environment Good Practice Advice in Planning: 2* (online). Available at: https://historicengland.org.uk/images-books/publications/gpa2-managing-significance-in-decision-taking/gpa2/ (Accessed January 2024).

8 HE (2017). *The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning: 3* (2nd Edition) (online). Available at: https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/ (Accessed January 2024).

9 Historic England (2016). *England's Redundant Post-War Coal- and Oil-Fired Power Stations: Guidelines for Recording and Archiving Their Records* (online). https://historicengland.org.uk/images-books/publications/englands-redundant-post-war-coal-and-oil-fired-power-stations/heag088-power-stations/ (Accessed January 2024).

10 Chartered Institute for Archaeologists (CIfA), (2019). *Standard and guidance for the archaeological investigation and recording of standing buildings or structures*. (Online) Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GBuildings_3.pdf (Accessed January 2024)

11 CIfA, (2014). *Standard and guidance for commissioning work or providing consultancy advice on archaeology and the historic environment*. (Online) Available at: https://www.archaeologists.net/sites/default/files/CIfAS&GCommissioning_1.pdf (Accessed January 2024)

Technical Guidance	Context
Standard and guidance for Historic Environment desk-based assessment[12]	Sets out standards for the production of archaeological desk-based assessments.

13.3 Data gathering methodology

Study Area

13.3.1. The Study Area for this historic environment assessment has been set as a 5 km radius from the Works Area boundary. This has been derived in accordance with best practice through the application of a Preliminary Zone of Theoretical Visibility (ZTV) presented at the EIA Scoping Report stage and informed by professional judgement; see **Figure 13.1**, in order to identify designated assets which could be affected by a change in their settings. This assessment considers designated and non-designated heritage assets within the Nuclear Site Licence boundary (hereafter referred to as the 'Site') and a 1 km Study Area, as well as designated heritage assets within the 5 km Study Area.

13.3.2. Designated heritage assets are statutorily protected and include listed buildings, scheduled monuments, registered park and gardens and conservation areas. There are no designated heritage assets within the Site, however, they are present within the 5 km Study Area.

13.3.3. Non-designated heritage assets can include artefacts, sites of archaeological interest or surviving structures and man-made features within the landscape that are of historic interest but are not statutorily protected. Known non-designated heritage assets are recorded on the Somerset Historic Environment Record within the Site and 1 km Study Area.

Desk study

13.3.4. The desk study for cultural heritage has been undertaken with reference to the guidance set out in Section 13.2, supported by a number of data sources. The principal data sources which were used to inform the desk study presented in this chapter comprise:

- Somerset Historic Environment Record (HER) (held by South West Heritage Trust), data search undertaken in January 2024;
- National Heritage List for England (NHLE);
- Historic Mapping and further information available through the Somerset Heritage Centre;
- Historic Environment Impact Assessment (Chapter 23) prepared for the Hinkley Point C Development Site (Environmental Statement – Volume 2 Hinkley Point C Development Site, 201113) and associated figures; and
- British Geological Survey (BGS) Mapping[14].

13.3.5. In response to a specific point in the ONR Pre-application Opinion (see **Appendix 5A**; Section 3.2.5, paragraph 36), for further consideration of 'marine archaeology and shipwrecks and

[12] CIfA, (2017). *Standard and guidance for historic environment desk-based assessment*. (Online) Available at: https://www.archaeologists.net/sites/default/files/CIfAS%26GDBA_4.pdf (Accessed January 2024)
[13] EDF Energy (2011). Environmental Statement – Volume 2 Hinkley Point C Development Site. EDF; London.
[14] British Geological Survey (2022). GeoIndex (online). Available at: http://www.bgs.ac.uk/geoindex/ (Accessed August 2024).

geoarchaeology', **Appendix 5B** presents the marine archaeology and geoarchaeology baseline assessment within a Study Area of 1.5 km from the HPB shoreline. The Pre-application Opinion technical note (**Appendix 5B**) concludes that no significant historic environment impacts are anticipated based on the baseline assessment and therefore no further assessment is required. Nonetheless, to ensure that unforeseen marine archaeological remains can be appropriately identified and recorded if they are encountered during the Proposed Works, a Protocol for Archaeological Discovery (PAD) setting out the approach to the reporting and subsequent treatment of unexpected archaeological discoveries should be in place during the Proposed Works within the marine environment. The PAD is included as an embedded measure in **Table 13-6** and will be secured via the Environmental Management Plan (EMP).

Survey work

13.3.6. A site visit was undertaken on 10 August 2021 to survey the buildings at the Site[15] (**Appendix A**). The Site was surveyed, with the exclusion of restricted areas that would require specific health and safety permits or training to enable entry. The exclusion of these areas had no impact on the adequacy of the survey required to support this assessment, as no relevant assets had been identified therein.

13.3.7. Using information from the preliminary ZTV which is a digitally-generated tool for the identification of development visibility focussing, in this case, on the tallest building on site during the Proposed Works, the Safestore, on a bare earth model, see **Chapter 14: Landscape and Visual Impact Assessment**. Designated heritage assets within the Study Area were visited at the same time, and intervisibility between the Site and these features were assessed.

Data limitations

13.3.8. The following overall limitations have been identified:

- The baseline data collection has involved the completion of a desk-based assessment. This is a predictive tool and relies on a series of assumptions and extrapolations to develop an understanding of the potential extent and character of archaeological remains within the Works Area;
- The desk-based assessment has involved the collection of data from the Historic Environment Record (HER). The HER is continually updated as further data regarding the historic environment becomes available; for example, when the results of recent archaeological investigations are made available. As the HER is a record only of known features, it is not a reliable predictive tool, but can provide useful information that can be used with other information to develop an understanding of the potential presence, nature, and significance of archaeological remains.

13.3.9. These limitations are not considered to affect the robustness of the assessment of the likely significant effects of the Proposed Development.

[15] Wood Group UK Ltd (2021). Decommissioning Hinkley Point B Historic Environment Survey Report. Wood; London.

13.4 Consultation

Pre-application opinion

13.4.1. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the historic environment assessment and confirmation of how these are addressed by the assessment is included in **Table 13-4**.

Table 13-4 – Summary of Pre-application Opinion responses

Paragraph Ref.	Consideration	How addressed in the ES
Multiple	The ONR report references general comments from consultees on the Scoping Report (Appendix 3). This includes a point being noted that the study area for non-designated heritage assets or a historic landscape assessment has not been given, a point on the need for establishing the significance criteria of known heritage assets and unknown remains, a point on the need for a commissioned Somerset HER search and desk-based assessment, a point on the need for settings assessment of designated assets and detail of the buried archaeological potential of the Works Area.	Noted, **Section 13.3** of this ES chapter presents the data gathering methodology, **Section 13.5** presents the overall baseline, **Section 13.7** presents the assessment methodology, **Section 13.9** presents the scope of the assessment and **Section 13.10** presents the assessment of effects.
36	Other considerations: There are some potential topics that do not appear to have been considered (or considered sufficiently) in the scoping report. These include: ▪ Marine archaeology and shipwrecks; and ▪ Geoarchaeology.	Marine archaeology and shipwrecks and geoarchaeology are considered in the Pre-application Opinion Technical Note provided to the ONR (see **Appendix 5B**) and have subsequently been scoped out for further assessment.

Non-statutory consultation

13.4.2. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

13.4.3. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

13.4.4. Responses to both the first and second rounds of non-statutory engagement are presented in the Consultation Feedback Report. Comments relevant to the terrestrial biodiversity and ornithology assessment are summarised in **Table 13-5**.

Table 13-5 – Comments received during non-statutory consultation relevant to the historic environment assessment

Respondent	Comment received	Response from the Applicant
Round 1 consultation		
No comments were received during the Round 1 consultation relevant to the historic environment assessment.		
Round 2 consultation		
Somerset Council	The station at HPB is a non-designated heritage asset, which means that it has been identified as an asset that has a degree of local architectural and/or historic interest. This status does have material weight in the planning decision-making process as Chapter 16 of National Planning Policy Framework (NPPF) makes clear in respect of non-designated heritage assets. Any works to Hinkley Point B will need to fulfil the requirements this part of the NPPF.	The nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. This includes the non-designated heritage asset HPB buildings. An overview of national policy specific to decommissioning is provided in **Chapter 4: Policy and Legislation Overview** of this ES. However, the nuclear decommissioning policy documents do not provide specific reference to heritage. Therefore, the NPPF, whilst not the primary policy document for this application, is a material consideration and has been used to inform the assessment of likely effects of the Proposed Works. The assessment reported in this ES chapter has considered the impact of the Proposed Works on the HPB buildings as a non-designated heritage asset. In addition, as set out in **Table 13-6**, building recording is proposed to allow for the identification and recording of buildings within the Works Area prior to Preparations for Quiescence phase.
South West Heritage (via Somerset Council)	The construction of HPB is very likely to have removed (or at least seriously impacted) any buried archaeology on the site itself as identified by the Desk-based assessment. The structure itself is a heritage asset and therefore it should be recorded as per the NPPF paragraph 211 and the best method to achieve this is for the applicant to submit a Written Scheme of	It is noted that South West Heritage view that buried archaeology on Site is very likely to have been removed during the original construction of HPB. The assessment reported in this ES chapter has considered the impact of the Proposed Works on the HPB buildings as a non- designated heritage asset. In

Respondent	Comment received	Response from the Applicant
	Building Recording to be agreed with the councils archaeological advisors.	addition, as set out in **Table 13-6**, building recording is proposed to allow for the identification and recording of buildings within the Works Area prior to Preparations for Quiescence phase.
South West Heritage (via Somerset Council)	A protocol for Archaeological Discovery (PAD) is a reasonable response to the potential for archaeological or palaeontological discoveries made during any work effecting the marine environment or any strata likely to include fossil evidence.	It is noted that South West Heritage view that a PAD is acceptable.

Technical engagement

13.4.5. **Table 13-6** summarises the technical engagement that has been undertaken in relation to the historic environment assessment.

Table 13-6 Technical Engagement undertaken in relation to the historic environment assessment

Stakeholder	Meeting date	Points discussed
Historic England	12 June 2024	Meeting took place to provide an overview of the Proposed Works and report the initial findings of the assessment of effects. No specific queries were raised in relation to the assessment.

13.5 Overall baseline

Current baseline

Location, topography, and geology

13.5.1. HPB is set on the north coast of Somerset, approximately 6.5 km west of the River Parrett. The majority of the Works Area is occupied by built structures and hard standing (mainly access roads and car parks). The Works Area is bounded by agricultural land (pasture) to the south and east, with Hinkley Point A (HPA) and the construction of Hinkley Point C (HPC) to the west, and the Bristol Channel to the north.

13.5.2. The topography of the Works Area is relatively level, situated on a coastal plain. The Site's ground level is c. 10.0 m above Ordnance Datum (AOD)[16].

13.5.3. The bedrock geology underlying the Works Area comprises Langport Member, Blue Lias Formation and Charmouth Mudstone Formation. This is sedimentary bedrock formed between 209.5 and 182.7 million years ago during the Triassic and Jurassic periods. There are no records for the superficial geology.[17]

Designated heritage assets

13.5.4. There are no designated heritage assets within the Works Area. Approximately 268 m south-west of the Works Area is a scheduled monument, Pixie's Mound (NHLE 1006226). Pixie's Mound is a Bronze Age round cairn at the summit of a low hill, which was previously excavated in 19th Century revealing a burial structure with human remains and funerary objects. The dating of this monument is uncertain, but sherds of Neolithic pottery were recovered during the excavation. Within the wider 5km Study Area there are three other scheduled monuments and these are listed in **Appendix 13B** and shown in **Figure 13.1**.

13.5.5. The closest listed buildings to the Works Area are over 1.2 km distant. The listed buildings within the Study Area consist of a variety of structures ranging from isolated farmhouses and religious structures through to urban developments and manor houses listed in **Appendix 13B** and shown in **Figure 13.1**.

13.5.6. One Conservation Area is located within the 5 km Study Area as listed in **Appendix 13B** and shown in **Figure 13.1**. This is Stogursey Conservation Area, which is located over 2.7 km south of the Works Area.

Non-Designated heritage records and previous investigations

13.5.7. There is one non-designated heritage record located within the Works Area boundary; Hinkley Point nuclear power station, Stogursey (45100)

13.5.8. A further 24 non-designated heritage records and 20 previous archaeological investigations (events) are located within a 1km radius of the Works Area (**Appendix 13C**).

Chronology

Prehistoric and Romano-British

13.5.9. There are remains of a submerged forest and peat deposits (HER 34078) on the shore at Stolford, 182m to the east of the Works Area. Radiocarbon dates obtained from the peats range from 7000-3500 Before Present.

13.5.10. The presence of the scheduled round cairn known as Pixie's Mound (NHLE 1006226, HER 34063) located within a field 268 m to the south-west of the Works Area, together with the results of excavations (HER 32303-7), fieldwalking and surveys undertaken to support the construction of HPC demonstrate that this area has been exploited by humans since the Mesolithic period and settled since at least the Bronze Age. Features recorded within the area range from flint spot finds,

[16] Topographic Map (n.d.) *Topographic Map*. (Online). Available at: https://en-gb.topographic-map.com/.(Accessed August 2024)

[17] BGS (2023) *Geology Viewer*. (Online). Available at: https://geologyviewer.bgs.ac.uk/ (Accessed August 2024)

boundary features, enclosures (HER 28448), a former well (HER 34064) and settlements (HER 32270). Further flint scatters have also been recovered to the east of the Works Area near Stolford. Some of these sites have demonstrated multi-phase activity showing that these early settlements were developed and still in use in the Romano British period (HER 28446, 28447, 34065, 35283, 35434). An excavation and watching brief (HER 32713) recorded Roman settlement to the south of the Works Area during 2013, including a late Roman corn dryer, two inhumation burials, ditches, and pits (HER 35434).

13.5.11. An archaeological record of a bone ring (HER 30188) is located at HPA, although there are no details of when this was recovered or what period it may relate to.

Early medieval, medieval, and post-medieval

13.5.12. There is little evidence of Anglo-Saxon activity occurring within the area with the only record dating to this period being a carbon date obtained on the fills of iron working pits excavated in 2016 at HPC. Additionally, a sunken-floored building was recorded at HPC in 2012, although no dating evidence was recovered (HER 32286).

13.5.13. The majority of settlements in the area surrounding Hinkley Point were established by the medieval period with Lilstock, Shurton, Kilton, Stringston, Stogursey, Fiddington, Otterhampton and Stockland Bristol all being recorded within the Domesday Book. A small settlement name, Seaburton (HER 34892), although no longer present, is also contained within the Domesday Book and this was in the location of what is now Hinkley Point. The grade II registered Fairfield Park (NHLE 1001144), which lies 3.3 km south-west of the Works Area, also contains evidence of medieval occupation including the grade II* listed Fairfield House (NHLE 1175243; 3.6 km south-west of the Works Area) which, although rebuilt in the late 16th Century, does have medieval origins.

13.5.14. Some areas of the coastline also contain evidence of medieval fish weirs (HER 27714-18), with fishing activity continuing into the post medieval period as evidenced by further fish weirs and traps both recorded through aerial imagery and surviving to the present day. Other post-medieval features include ridge and furrow (HER 27741), water meadows (HER 22752), an enclosure (HER 34654), groynes (HER 27737) and the sites of former barns (HER 22546-7), which reflect the post-medieval land management and agricultural activities of the area. Post-medieval boundaries were recorded during a watching brief to the south of the Works Area in 2020 (HER 42566).

Modern

13.5.15. Other than piecemeal development of existing structures and some shoreline management structures the only feature of note relating to the modern period are the HPA and HPB power stations, as well as the HPC power station which is under construction.

13.5.16. Within the Works Area, the HPB power station is identified within the Somerset HER (45100: Hinkley Point nuclear power station, Stogursey). The HPA power station is identified immediately west of the Works Area under the same HER entry.

13.5.17. Construction of the HPB nuclear power station began in 1967, with generation beginning in 1976. It was the first Advanced Gas-cooled Reactor (AGR) to generate electricity to the grid in the UK[18][19]. HPB and HPA were originally one site, which was divided prior to 2007.

Historic Landscape Characterisation

13.5.18. The Somerset and Exmoor Historic Landscape Characterisation (HLC) Project (2013) was carried out between 1999 and 2000 by Graham Fairclough and Oscar Aldred for Somerset County Council.

13.5.19. The majority of the Works Area is within area of Industry (HLC 5004), with the northern spur in Rock outcrop and scree (HLC 4179) and Mud flats on the coast (HLC 4105, HLC 7829).

13.5.20. Land to the east, west and south of the Works Area is characterised as enclosed field systems:

- To the east is Anciently Enclosed Land modified during the 17th to 19th centuries (HLC 3777), with a general field size of over 12ha, having less than 25% boundary loss since 1905. Previously wetland.
- To the west is Recently Enclosed Land during the 17th to 18th centuries (HLC 3644) with a general field size of 3-6ha, having between 25% and 50% boundary loss since 1905.
- To the south is Anciently Enclosed Land pre-17th century (HLC 2560), with a general field size of 6-12ha, having less than 25% boundary loss since 1905, and Recently Enclosed Land 17th to 18th century (HLC 3693) with a general field size of 3-6ha, having between 25% and 50% boundary loss since 1905.
- The enclosed field systems category dominates the Somerset and Exmoor HLC; accounting for 80% of the total area characterised.

Future baseline

13.5.21. Changes over time within the Study Area may occur which could change the settings of nearby heritage assets and could affect the perceptual presence of the Proposed Works in the settings of those heritage assets. This change could arise through natural processes (e.g. the maturity of woodlands) or due to human activity, land use change, management, or neglect, meaning that it is not possible to make detailed predictions as to the nature of this change over the extended timescales that apply to the Proposed Works. As a result, the effects of the Proposed Works on heritage assets during all phases will be considered against the existing baseline except where significant change can reasonably be predicted.

13.5.22. Immediately to the west of HPA is the HPC New Nuclear Build site, which is currently under construction. As it evolves, HPC has potential to affect the settings of nearby heritage assets, especially Pixie's Mound and those listed buildings to the south of HPC with views to the north and the coastline, such as in Stogursey, Shurton and Wick. However, the listed buildings within these locations have local settings defined by their immediate rural or village locations, and therefore effects to their settings would not be significant. In the case of Pixies Mound, HPC committed to a monument management plan being implemented to reduce the level of effect experienced such that it would be **Not Significant**.

[18] EDF Energy (2021). Hinkley Point B power station (online). Available at: https://www.edfenergy.com/energy/power-stations/hinkley-point-b (Accessed August 2024).
[19] Wayne D. Cocroft (2019). *England's Atomic Age: Securing its Architectural and Technological Legacy*. Nuclear Power Stations. Heritage Values and Preservation Perspectives, 2017. International Council on Monuments and Sites.

13.6 Embedded environmental and good practice measures

13.6.1. **Table 13-6** outlines the embedded and good practice environmental measures proposed to reduce the potential for historic environment effects.

Table 13-6 – Summary of embedded environmental measures

Embedded Measure	Compliance Mechanism	Embedded measure / good practice
A written scheme of investigation for building recording works, to be agreed with the local authority. This scheme would allow for the identification and recording of buildings within the Works Area prior to Preparations for Quiescence phase, providing mitigation for adverse effects resulting from the loss of buildings with historic interest.	Component of the EMP.	Embedded measure
A Protocol for Archaeological Discovery (PAD) is to be in place prior to the commencement of the Proposed Works in the marine environment, to set out the approach to the reporting and subsequent treatment of unexpected archaeological discoveries.	Component of the EMP.	Embedded measure

13.7 Assessment methodology

13.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in Section 5.3 and Section 5.4. However, whilst this has informed the approach that has been used in this historic environment chapter, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the historic environment assessment in the Environmental Statement (ES).

General approach

Determination of significance

13.7.2. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR)[20] recognise that development proposals will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identifies those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the development*".

13.7.3. The EIADR does not define significance of an effect and it is necessary to state how this will be defined for the EIA. The significance of an effect resulting from construction, operation or dismantling of a development is most commonly assessed by reference to the importance of a receptor and the magnitude of the effect upon it. This approach provides a mechanism for identifying

[20] Office for Nuclear Regulation, (1999). *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations (EIADR)*. (Online). Available at: Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations (EIADR) | Office for Nuclear Regulation (onr.org.uk) (Accessed August 2024)

areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.

13.7.4. **Table 13-7** details the basis for assessing receptor importance. The rationale is predominantly based on information provided within the NPPF. Note that categorisation of those assets which are of less than national importance generally relies on professional judgement and where relevant, the policy context set out in **Table 13-2** and the relevant technical guidance set out in **Table 13-3**.

Table 13-7 – Establishing the importance of receptors

Importance	Receptor type	Sensitivity
High	▪ Scheduled Monuments; ▪ Grade I listed buildings; ▪ Grade II* listed buildings; ▪ Grade II listed buildings with exceptional qualities in fabric, historical association, and/or association/group value with heritage assets of high significance; ▪ Protected Wrecks; ▪ Registered Battlefield; ▪ Conservation Areas containing very important (Grade I / II*) listed buildings; ▪ Grade I and II* Registered Parks and Gardens; ▪ Protected heritage landscapes (e.g. ancient woodland or historic hedgerows, heritage Sites of Special Scientific Interest); ▪ Burial grounds; and ▪ Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of national importance.	These assets are considered highly sensitive due to their national importance, and it is possible that low-moderate impacts upon these assets or their settings could lead to significant effects.
Medium	▪ Grade II listed buildings which can be shown to have qualities in their fabric or historical association of regional importance only; ▪ Conservation Areas containing primarily Grade II listed or locally listed buildings; ▪ Grade II Registered Parks and Gardens; ▪ Locally listed buildings; and ▪ Non-designated heritage assets (above ground structures, landscape,	These assets are best seen as of regional or more than local importance and their sensitivity will largely depend upon their current setting and their character. It is possible that moderate-high impacts upon these assets or their settings could lead to significant effects.

Importance	Receptor type	Sensitivity
	townscape, buried remains) of regional importance.	
Low	▪ Non-designated heritage assets (above ground structures, landscape, townscape, buried remains) of local importance	These include assets of local interest, some of which no longer survive and may have limited potential for survival of archaeological material. Although these assets must be considered and mitigation may be required, significant effects are only likely if the assets were to be predominantly or totally destroyed as a result of the Proposed Works.
Negligible	▪ Item with no significant heritage value or interest.	Due to its nature of form / condition / survival, the feature cannot be considered an asset in its own right but may inform the EIA or suggest the potential for further remains (e.g. non-extant HER record, chance find, record of recorded feature that cannot be located).

13.7.5. Magnitude of change is a measure of the extent to which the significance of an asset would be disturbed or lost.

13.7.6. In respect of buried archaeological deposits, where no remains are visible above ground, this would arise from disturbance or removal of archaeological material. Loss, damage, or alteration of a structure would not only affect architectural value but could also result in the loss of elements valued for their archaeological potential or historic associations.

13.7.7. The setting of any particular asset is unique and may comprise both tangible and intangible aspects of the assets' context which contribute to how they may be understood, appreciated, and experienced. The effects of change in the setting of a heritage asset depend on the contribution of that setting to the significance of the asset, and assessments must be, by their nature, specific to the individual assets being considered.

13.7.8. The magnitude of change (or impact) is based on the extent to which the significance of an asset is affected, which can be influenced by a number of factors.

13.7.9. **Table 13-8** details the basis for assessing magnitude of change:

- the permanence of the impact (temporary, permanent, or reversible);
- changes caused by the impact (both positive and negative relating to differing degrees of adverse or beneficial effect); and
- the extent or aspect of the heritage asset or its setting that would be affected (for example, the whole or a very small part) and the contribution of that part to the historic value of the asset.

Table 13-8 – Establishing the magnitude of change

Magnitude	Criteria (Adverse)	Criteria (Beneficial)
High	Total or substantial demolition / disturbance of a heritage asset, or disassociation of an asset from its setting.	Sympathetic restoration of an at-risk or otherwise degraded heritage asset and/or its setting. Bringing an at-risk heritage asset into sustainable use, with robust long-term management secured.
Medium	Partial disturbance or inappropriate alteration of a heritage asset. Change to the key characteristics of a heritage asset's setting, which affects the importance of the asset, but which still allows its cultural significance to be appreciated.	Appropriate stabilisation and/or enhancement of a heritage asset and/or its setting that better reveal the significance of the asset or contribute to a long-term sustainable use or management regime.
Low	Minor loss to or alteration of an asset which leave its current importance largely intact. Minor and short-term changes to setting which do not affect the key characteristics and in which the historical context remains substantially intact.	Minor enhancements to a heritage asset and/or its setting that better reveal its significance or contribute to sustainable use and management.
Negligible	Minor alteration of an asset which does not discernibly affect its importance. Minor and short term or reversible change to setting which do not affect the asset.	Minor alteration of an asset which does not affect its significance in any discernible way. Minor and/or short-term or reversible change to setting which does not affect the significance of the asset.

13.7.10. The significance evaluation matrix illustrates the determination of effects as significant or not significant based on the magnitude of change and the sensitivity of the receptor. This is presented below in **Table 13-9**.

Table 13-9 – Significance evaluation matrix

		Magnitude of change			
		High	Medium	Low	Negligible
Receptor Importance	High	**Major beneficial/ adverse (Significant)**	**Major beneficial/ adverse (Significant)**	Moderate beneficial/adverse (Significant)	Minor beneficial/ adverse (Not significant)
	Medium	**Major beneficial/ adverse (Significant)**	Moderate beneficial/ adverse (Significant)	Minor beneficial/adverse (Not significant)	Minor beneficial/ adverse (Not significant)
	Low	Moderate beneficial/ adverse (Significant)	Minor beneficial/ adverse (Not significant)	Minor beneficial/adverse (Not significant)	Minor beneficial/ adverse (Not significant)
	Negligible	Minor beneficial/ adverse (Not significant)	Minor beneficial/ adverse (Not significant)	Minor beneficial/adverse (Not significant)	Minor beneficial/ adverse (Not significant)

13.8 Assumptions and limitations

13.8.1. The data representing designated heritage assets and non-designated heritage records presented in this chapter represents records held at the point in time in which it was obtained, in January 2024. The Works Area survey that informed the baseline assessment represented a point-in-time site attendance of August 2021 but is considered to provide a representative example of the Works Area in the context of designated assets.

13.9 Scope of the assessment

Study Area

13.9.1. The primary Study Area for the historic environment assessment includes a buffer distance of 5 km from the Works Area for designated assets (assessed for indirect effects arising through change to setting as shown in **Figure 13.1**), with a smaller Study Area of 1 km intended for non-designated assets and historic landscape assessment.

13.9.2. The temporal scope of the assessment of historic environment effects is consistent with the period over which the Proposed Works will be carried out. This is distinguished by three phases: the Preparations for Quiescence, Quiescence and Final Site Clearance phases of the Proposed Works. Both the Preparation for Quiescence and Quiescence phases are time-limited in terms of their effects, with detail on the temporal scope and activities undertaken during each phase provided in **Chapter 2 Section 2.3.**

13.9.3. The Safestore construction, building demolition and site clearance activities during the Preparations for Quiescence phase, would result in effects related to moving plant, associated visual and audible effects and the removal of standing structures. The effects of the Quiescence phase are predominantly visual and relate to the retention of the Safestore structure. The effects of Final Site Clearance (mobilisation and operation of moving plant on Site in the process of Safestore demolition) would bear effects during the relevant activities. At the closure of the Final Site Clearance phase (the removal of the Safestore structure and return of the former facility to brownfield status), the effects would be permanent.

13.9.4. The assessment of indirect effects arising through change to setting refers to the **Chapter 14: Landscape and Visual Impact Assessment.**

Potential receptors

13.9.5. Receptors that were considered at the EIA Scoping stage and their potential relevance for further assessment in this ES chapter are summarised in **Table 13-10**.

Table 13-10 – Receptor assessment considerations

Receptor	Reason for consideration
Non-designated buried heritage assets within the Works Area	The current baseline suggests no potential for buried remains as construction of the existing power station buildings would have removed below ground deposits of potential archaeological interest. While the baseline conditions informing broader archaeological potential within the surroundings of the Works Area are set out in **Section 13.5**, such remains are not taken forward for assessment of effects. The Proposed Works would not give rise to loss of archaeological remains. Section **2.3** describes the decommissioning process. All Conventional Area buildings and structures will be demolished in their entirety, including the removal of any cabling to ground level. Whilst demolition is generally to ground level, some buildings on-site contain basements that also require demolition and deconstruction. Likewise, there is a need to undertake some works below ground level to remove trenched pipework where land contamination may have occurred during operation. Below ground demolition works would be in areas disturbed by previous construction.
Marine archaeology	This is considered within in the technical note provided in **Appendix 5B** in relation to the assumptions for works in the marine environment. The technical note concluded that, while no historic environment impacts are anticipated, a PAD setting out the approach to the reporting and subsequent treatment of unexpected archaeological discoveries should be in place during the Proposed Works that are offshore.

Receptor	Reason for consideration
Non-designated built heritage assets	The Proposed Works will give rise to loss of structures of limited interest for their place in the history of nuclear power generation by demolition of HPB.
Designated heritage assets	Change to setting arising from visibility of or noise associated with the Proposed Works could affect the setting of those assets within the Study Area. Consideration of the designated heritage assets likely to be impacted is provided in **Table 13-11** below.

13.9.6. Receptors within both the 5 km Study Area and ZTV that were considered at the EIA Scoping stage and their relevance for further assessment for likely significant environment effects in this ES chapter are listed in **Table 13-11**. This is the Step 1 Assessment of The Setting of Heritage Assets guidance[21].

Table 13-11 – Step 1 Assessment. Potential significant historic environment effects

Reference	Receptor Name	Rationale	Potential significant effects
Scheduled Monuments			
NHLE 1006226	Scheduled round cairn known as Pixie's Mound	268 m south-west of the Works Area. The monument is a Bronze Age funerary round cairn situated at the summit of a low hill, a prominent location overlooking Bridgwater Bay at Hinkley Point. The barrow survives as a circular mound measuring up to 27 m in diameter and 1.7 m high and has been repeatedly excavated in antiquity. The views towards HPB are partially obscured by dense trees, but the power station and associated overhead lines are clearly visible. Potential effect due to prominent position in the landscape and proximity to development.	Y

[21] HE (2017). *The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning: 3* (2nd Edition) (online). Available at: https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/ (Accessed January 2024).

Reference	Receptor Name	Rationale	Potential significant effects
NHLE 1019034	Village cross 75 m north of St Andrew's Well	Within the ZTV, 2.98 km south of the Works Area. Medieval standing cross located by a holy well. Setting defined by village location, which obscures views. Negligible change.	N
NHLE 1019035	Stogursey Castle	Partially within ZTV, 3.16 km south of the Works Area. The monument is a medieval motte and bailey castle situated on low lying ground to the south of Stogursey village. The castle includes a motte with a stone shell keep, an inner bailey and an outer bailey. Setting defined by village location to the south of Stogursey, with undulating topography and the village itself obscuring views towards HPB. Negligible change.	N
Listed Buildings			
NHLE 1449993	Grade II Church of St Peter	Within ZTV, 1.47 km south-east of the Works Area. The Church of St Peter, a prefabricated timber building of 1854 which was erected at its current location in Stolford in 1866, is listed at Grade II for architectural and historic interest. It was previously located in West Quantoxhead (16 km to the west) as a temporary measure, while a stone church was constructed. Setting defined by location in the village of Stolford. The views towards HPB are obscured by adjacent buildings and tall field hedges. Negligible change.	N
NHLE 1175742	Grade II Chalcot Farmhouse	Within ZTV, 2.19 km south-east of the Works Area.17th century farmhouse, enlarged in the early-19th century, being extensively altered internally it was listed primarily for the early 19th century façade. Farmhouse setting defined by rural location in Stolford.	N

Reference	Receptor Name	Rationale	Potential significant effects
		Access to the area of the farmhouse itself was not possible, but adjacent views towards HPB are screened by undulating topography and tall hedges. Negligible change.	
Wick Group NHLE 1175753 NHLE 1345703	Grade II: Zine Farmhouse Wick Pound House	Within ZTV, 1.30 km south-east of the Works Area. 17th and 18th century farmhouses subsequently altered. There is a direct view to HPB from Zine Farmhouse. Potential effect due to prominent position in the landscape and proximity to development.	Y
Stolford Group NHLE 1057379 NHLE 1057378 NHLE 1308209	Grade II: Sea View Stolford Farmhouse D'Arches	Within ZTV, 1.55 km east of the Works Area. 17th century fisherman's cottage, farmhouse, and house. There is a direct view from Sea View to HPB with the power station being clearly visible above the existing hedges. Potential effect due to prominent position in the landscape and proximity to development.	Y
NHLE 1295357	Grade II Water Farmhouse, Stogursey	Within ZTV, 3.05 km south-west of the Works Area. 16th century farmhouse with later alterations. Farmhouse setting defined by rural location in Stogursey. There are intermittent and partial views to HPB, the views are difficult to discern, with the majority obscured by high hedges. Negligible change.	N
NHLE 1237562	Grade II The Poplars, Stockland Bristol	Within ZTV, 3.40 km south-east of the Works Area.17th-18th century house. Residential setting defined by village location in Stockland Bristol. There is a direct view to HPB, but at a significant distance and the power station and the associated overhead lines are not readily discernible in most views of or from the asset. Negligible change.	N

Reference	Receptor Name	Rationale	Potential significant effects
NHLE 1059049	Grade II Church of St Mary Magdalene, Stockland Bristol	Within ZTV, 3.41 km south-east of the Works Area. 19th century stone parish church, dated to 1865 from documents with links to the Daniel family of Stockland Manor, located on the Site of an earlier parish church. Setting defined by village location in Stockland Bristol. There was a partial view to HPB from the church yard boundary, which was not readily discernible in most views of or from the asset. It was heavily screened by trees and would only be visible if the viewer actively searched. Negligible change.	N
NHLE 1059050	Grade II Rogers Farmhouse	Within ZTV, 3.62 km south-east of the Works Area. 17th century farmhouse. Setting defined by village location in Stockland Bristol, which obscures views. Negligible change.	N
Otterhampton Group NHLE 1344927 NHLE 1059048	Grade II* Church of All Saints Grade II The Old Rectory, Otterhampton	Within ZTV, 4.05 km south-east of the Works Area. 12th century parish church and early 19th century rectory, now a house. Setting defined by village location in Otterhampton. There were no direct views due to undulating topography. Negligible change at this distance.	N
NHLE 1057402	Grade II Shurton Mills, Stogursey	Within ZTV, 1.80 km south-west of the Works Area. 17th century mill owner's house and attached outbuildings to north. The mill was attached to the south-west and not included in the listing. Setting defined by rural location in Shurton. There were no direct views due to dense wooded vegetation. Negligible change.	N
NHLE 1057392	Grade II Baptist Chapel, Stogursey	Within ZTV, 2.40 km south-west of the Works Area. Dated to 1833, single story. Setting defined by village	N

Reference	Receptor Name	Rationale	Potential significant effects
		location in Burton. There were no direct views due to high field hedges. Negligible change.	
NHLE 1057391	Grade II The Manse, Stogursey	Within ZTV, 2.40 km south-west of the Works Area. Late 18th century house adjoining the Baptist Chapel (NHLE 1057392). Setting defined by village location in Burton. There were no direct views due to high field hedges. Negligible change.	N
NHLE 1057382	Grade II Limekiln Complex	On periphery of ZTV, 3.71 km west of the Works Area. Mid-19th century limekiln complex on the seashore, in poor condition and overgrown. Comprises part of the 19th century port of Lilstock, which traded Welsh coal and pit props. Setting defined by coastal location in Lilstock. Listed primarily for historic interest. The limekiln complex was heavily overgrown and vegetation obscured direct views to HPB, which was not readily discernible in most views of or from the asset. However, there were direct long-distanced views from the adjacent seashore. Negligible change.	N
NHLE 1057381	Grade II Church of St Nicholas	On periphery of ZTV, 4.74 km south-west of the Works Area. Setting defined by village location in Kilton, which obscures views. Negligible change.	N
Shurton group NHLE 1057400 NHLE 1057401 NHLE 1175316 NHLE 1175331	Grade II: Thatch End Cottage, 15 Metres North of Shurton Lodge Footbridge, 5 Metres South West Of Thatch End	Within ZTV, 1.75 km south-west of the Works Area. 17th century cottages, footbridge, house, and farmhouse. Setting defined by village location in Shurton, which obscures views. Negligible change.	N

Reference	Receptor Name	Rationale	Potential significant effects
	Shurton Lodge and Outbuilding Attached At South East Corner		
NHLE 1175396	Ash Cottage and Little Ash		
NHLE 1345712	Brookside Fishers		
Steyning Group		On periphery of ZTV, 3.07 km south of the Works Area. 15th century manor house and grounds. Setting defined by rural location in Cockwood, topography and distance obscures views. Negligible change.	N
NHLE 1057395	Grade II* Steyning Manor		
NHLE 1057396	Grade II Stable, About 20 Metres north-west Of Steyning Manor		
NHLE 1175230	Grade II Gate and Piers, About 20 Metres West of Steyning Manor		
NHLE 1175243	Grade II* Fairfield	Only a small area is within ZTV, 3.63 km south-west of the Works Area. Setting defined by rural location to the west of Stogursey, where topography and distance obscures views. Negligible change.	N
NHLE 1345702	Grade II Durborough Farmhouse	Within ZTV, 4.70 km south-west of the Works Area. 17th farmhouse. Setting defined by rural location in Durborough, where topography and distance obscures views. Negligible change.	N
Stogursey Group	Grade II:	Within ZTV, 2.83 km south-west of the Works Area. Setting defined by rural location to the north-west of Stogursey, where topography and distance obscures views. Negligible change.	N
NHLE 1057393	Colepool Cottage		
NHLE 1057394	Grisley's Farmhouse		
Stogursey Conservation Area Group		Partially within ZTV, 2.92 km south of the Works Area. Village of Stogursey conservation area. Setting defined by village location in undulating topography, which obscures views. Negligible change	N
NHLE 1057404	Grade I Church of St Andrew		
NHLE 1057403	Grade II* Stogursey Castle		
NHLE 1345701	Grade II* Remains of Village Cross		

Reference	Receptor Name	Rationale	Potential significant effects
NHLE 1295315	Grade II* Causeway Bridge at East Entrance To Stogursey Castle		
	Grade II:		
NHLE 1057368	Gates And Gatepiers to Ivy House		
NHLE 1057369	Dovecote, About 28 Metres North West Of Priory Farmhouse		
NHLE 1057370	Corner Cottage		
NHLE 1057371	Cross Cottages		
NHLE 1057372	Old Cross House		
NHLE 1057373	Railings, Gate and Dwarf Wall Fronting Old Cross House Onto High Street		
NHLE 1057374	Gatepiers And Entrance to Chippings, Abutting West Side Of St Andrews Well, And Adjoining Wall Running North To St Andrews Road		
NHLE 1057375	St Andrews Well		
NHLE 1057376	6, St Andrews Road		
NHLE 1057377	Darch House, Railings, Gates, and Dwarf Wall Fronting Road		
NHLE 1057405	Unidentified Chest Tomb in Churchyard, 7 Metres North of North Transept-Choir, Church of St Andrew		
NHLE 1057406	South Boundary Wall Churchyard Running West from East Entrance, Church of St Andrew		
NHLE 1057407	Stoke House		
NHLE 1057408	Bakehouse, 5 Metres North of No 8		

Reference	Receptor Name	Rationale	Potential significant effects
NHLE 1175415	Mill House and Waterwheel The Old Mill		
NHLE 1175464	The Old Vicarage		
NHLE 1175508	Buffet Chest Tomb, In Churchyard 3 Metres North of North Transept-Choir, Church of St Andrew		
NHLE 1175525	2 Piers, Railings, Dwarf Wall, Gatepiers, Gates and Lamp Carrier Fronting Church of St Andrew		
NHLE 1175549	30, High Street		
NHLE 1175557	8 and 10, High Street		
NHLE 1175574	6, High Street		
NHLE 1175664	No 5 And Boundary Wall on West Side Abutting St Andrews Well		
NHLE 1175681	Pear Tree		
NHLE 1175713	Stogursey School and Attached Schoolmaster's House		
NHLE 1308312	Pair Of Chest Tomb to John And Mary Rawlins In Churchyard, 23 Metres North of Nave, Church of St Andrew		
NHLE 1345675	Rowe Family Chest Tomb, In Churchyard 15 Metres South of Nave, Church of St Andrew		
NHLE 1345676	Gate And Gate Piers at East Entrance To Churchyard, Church of St Andrew		
NHLE 1345677	12 and 14, High Street		
NHLE 1345700	2, High Street		
NHLE 1345714	Harford House		
NHLE 1431083	Stogursey War Memorial		

Reference	Receptor Name	Rationale	Potential significant effects
Registered Parks and Gardens			
NHLE 1001144	Grade II Fairfield	Only a small area is within ZTV, 3.28 km south-west of the Works Area. Setting defined by rural location to the west of Stogursey, where topography and distance obscures views. Negligible change.	N

13.9.7. The designated historic environment receptors that are carried forward for assessment include:

- Scheduled round cairn known as Pixie's Mound (NHLE 1006226);
- Wick Group. Grade II listed Zine Farmhouse and Wick Pound House (NHLE 1175753,1345703); and
- Stolford Group. Grade II listed Sea View, Stolford Farmhouse, and D'Arches (NHLE 1057379, 1057378, 1308209).

Likely significant effects

13.9.8. The likely significant historic environment effects that have been taken forward for assessment in this ES are summarised in **Table 13-12**.

Table 13-12 – Likely significant historic environment effects

Phase of Works	Receptor	Likely significant effects
Preparations for Quiescence phase	**Non-designated buildings of historic interest at HPB power station.**	Alteration and/or concealment of power station structures.
	Designated heritage assets.	Demolition of buildings that may be considered historically or architecturally important.
		Change in views from surrounding assets occurring from the construction of the Safestore and demolition of uncontaminated buildings.
		Change of how an asset in close proximity is experienced due to noise associated with demolition and increased traffic.

Phase of Works	Receptor	Likely significant effects
Quiescence phase	**Designated heritage assets.**	The Safestore may appear in key views of and from surrounding assets.
Final Site Clearance phase	**Designated heritage assets.** **Non-designated buildings of historic interest at HPB power station.**	Works to dismantle and remove the Safestore structure may change how an asset in close proximity is experienced due to noise and traffic associated with on-site works. Demolition of buildings that may be considered historically or architecturally important.
End of Final Site Clearance	**Designated heritage assets** **Non-designated buildings of historic interest at HPB power station.**	Full removal of a visual element forming part of the existing setting of receptors.

13.10 Assessment of effects

Effects arising through disturbance (Preparations for Quiescence phase)

HPB buildings

13.10.1. The majority of the buildings at HPB are the original constructions of the 1960s and 1970s, interspersed with newer additions, replacements, and cabins across the Site. HPB is considered to be a historic asset of **low** importance because of:

13.10.2. Architectural interest: HPB is an example of power station architecture of the late 1960s and can be compared in its architectural treatment and functional layout with later coal-fired power stations of similar age and with earlier and later generations of nuclear power stations. The AGR plants and their associated landscaping schemes were a largely standardised and functional design with some changes made in architectural treatment to suit local circumstances. It has the potential to inform study of the technical processes and social/cultural functioning of a nuclear power station as reflected in building appearance and design, particularly in comparison to the earlier and subsequent generations of nuclear power stations both on this site and more widely in the UK.

13.10.3. Historic interest: The AGR plants were the second generation of nuclear power stations in the UK and reflected a changing relationship with both nuclear power generation and other power generation technology more widely, representing significant improvements in safety and efficiency over the previous generation of nuclear power generation.

13.10.4. Structures within the Works Area contribute in varying degrees to its historic value. The most notable are the reactor buildings and turbine halls, which present the key architectural response to the design and its location and incorporate the central elements of the power station. Ancillary

buildings of different generations of primarily functional architectural treatments and often of temporary construction, while of lesser value individually, have the potential to contribute to understanding of the history and operation of the power station.

13.10.5. The key historic value associated with HPB as a whole is functional/utilitarian: The ability of a facility to generate power and the design of individual buildings and layout of the whole station facility geared toward the management and execution of that purpose. HPB was one of a number of AGR power stations built and commissioned from the 1960s to 1980s and formed part of a stage in the development of the reactor design. It has importance in relation primarily to its regional context and status associated with this function, granting it **Medium** importance as a historic environment asset. The cessation of power generation reduces the assets' status as tied to historic social and economic interest, reducing their importance from a **Medium** during operation to **Low** in the decommissioning context.

13.10.6. The demolition of ancillary buildings and modification of the reactor building into a Safestore in the Preparations for Quiescence phase would see the effective removal of much of the original facility as noted above. This would constitute a **Medium** magnitude of change to a receptor of **Low** importance. This would result in a **Minor Adverse** effect and is **Not Significant**. During the Quiescence phase, the Safestore would remain unchanged, resulting In **No Effect**.

13.10.7. During Final Site Clearance, the Safestore which includes the reactors will be dismantled. This will remove the generating element of the operational power station. This would constitute a **High** magnitude of change to a receptor of **Low** sensitivity. This would result in a **Minor Adverse** effect and is **Not Significant**.

13.10.8. The good practice environmental measures detailed in **Table 13-6** will be implemented, creating a record explicitly focused on historic interest offsetting the loss and alteration of the physical assets. The resulting **Minor Adverse** effect would be **Not Significant.**

Effects arising through change to setting (Preparations for Quiescence, Quiescence and Final Site Clearance phase)

Scheduled round cairn known as Pixie's Mound (NHLE 1006226)

Importance and present setting

13.10.9. Pixie's Mound is a scheduled monument located 268 m south-west of the Works Area. The monument includes a Bronze Age funerary round cairn situated at the summit of a low hill, a prominent location overlooking Bridgwater Bay at Hinkley Point, with the most open views across the slightly lower land to the north-east. To the north and west, the land rises, obscuring views. The barrow survives as a circular mound measuring up to 27 m in diameter and 1.7 m high and has been repeatedly excavated in antiquity. The views towards HPB are partially obscured by dense trees, but the power station and associated overhead lines are clearly visible. Pixies' Mound is not located within an immediate group of barrows, the closest concentration of barrows in the vicinity are on the Quantock Hills, approximately 8.5 km to the south-west.

Change to setting

13.10.10. The works associated with the Preparations for Quiescence phase which entail the removal of ancillary buildings from HPB would, it is anticipated, be largely obscured in views from the monument owing to the intervening presence of dense trees obscuring views of lower lying structures. The construction of the Safestore around the reactor building would introduce a visual

change though the general sense of massing and functionality would be retained. The Final Site Clearance, which would include removing the reactor building and Safestore structure, would effectively return this view from Pixies Mound as open space.

13.10.11. The deconstruction and demolition of ancillary buildings during Preparation for Quiescence and modification of the existing reactor buildings into a Safestore are not considered to notably interact with the audible setting of Pixies Mound via the deconstruction, demolition or associated traffic noise produced, and neither is the demolition in Final Site Clearance compared to the baseline environment. This is due to the distance from HPB, the partial tree cover, and the baseline noise of the HPB site.

Significance of effect

13.10.12. As the magnitude of change to this scheduled monument, a receptor of **High** sensitivity, resulting from change to setting of this monument is anticipated to be **Negligible**, the effects of the Preparations for Quiescence, would be **Minor Adverse** and therefore **Not Significant**. During the Quiescence phase effects are anticipated to be **Minor Adverse** owing to visibility of the Safestore, and the effect would be **Not Significant**. At the end of Final Site Clearance, the Safestore will disappear from view which would be a negligible change in setting for the asset, resulting in a **Minor Beneficial** and therefore **Not Significant** effect.

Wick group. Grade II listed Zine Farmhouse and Wick Pound House (NHLE 1175753,1345703)

Importance and present setting

13.10.13. Zine Farmhouse and Wick Pound House are Grade II listed buildings located 1.30 km south-east of the Works Area. Zine Farmhouse is of historic significance as a 17th century farmhouse, subsequently altered during the 18th and 20th centuries. Wick Pound House is of historic significance as an 18th century farmhouse. The farmhouse settings are defined by their rural location to the east of Wick, with associated outbuildings and fields, situated on flat land in proximity to the Stogursy Brook.

Change to setting

13.10.14. None of the ancillary buildings are visible from Zine Farmhouse and their deconstruction and demolition during Preparation for Quiescence would have no effect on views from the monument or any bearing on its setting. The modification of the reactor building into a Safestore would, while introducing a change in views of the building retain the general sense of a visibly modern, utilitarian structure and massing in these long views, prior to eventual demolition during Final Site Clearance. Due to the intervening distance between the asset and the Works Area, it is not anticipated that there will be any change to setting caused from noise emissions during the Preparations for Quiescence or Final Site Clearance phases. Change to the setting of this monument is therefore anticipated to be minimal through all phases of the proposed works. After the completion of the Proposed Works at the end of Final Site Clearance, the Safestore will disappear from the setting of Zine farmhouse.

Significance of effect

13.10.15. As the magnitude of change to this listed building group, a receptor of **High** sensitivity, resulting from change to setting of this monument is anticipated to be **Negligible**, the effects of the Preparations for Quiescence, would be **Minor Adverse** and therefore **Not Significant**. During the Quiescence phase effects are anticipated to be **Minor Adverse** owing to visibility of the Safestore,

and **Not Significant**. At the end of Final Site Clearance, the Safestore will disappear from view which would be a negligible change in setting for the asset, resulting in a **Minor Beneficial** and therefore **Not Significant** effect.

Stolford Group. Grade II listed Sea View, Stolford Farmhouse, and D'Arches (NHLE 1057379, 1057378, 1308209)

Importance and present setting

13.10.16. Sea View, Stolford Farmhouse, and D'Arches are Grade II listed buildings located 1.55 km east of the Works Area. Sea View is of historic significance as a 17th century fisherman's cottage, with extensive later alterations. Stolford Farmhouse is of historic significance as a 16-17th century farmhouse, with two storeys of rubble construction, a slate roof, and cross passage, and 19th century alterations. D'Arches house is of historic significance as a 17th century house, with one and a half storeys,of rubble construction, a pantiled roof, and three cell layout with cross passage, and 20th century alterations.

13.10.17. The group setting is defined by the village location on the coast at Stolford, with access to the Stolford Seafront to the north-east. There is a direct view from Sea View to HPB with the power station being clearly visible above the existing hedges. Potential effect due to prominent position in the landscape and proximity to development.

Change to setting

13.10.18. The works associated with the Preparations for Quiescence phase which entail the removal of ancillary buildings from HPB would, it is anticipated, be largely obscured in views from the monument owing to the intervening presence of undulating topography, high hedges and Stolford village obscuring views of lower lying structures. The construction of the Safestore around the reactor building would introduce a visual change, though the general sense of massing and functionality would be retained. The Final Site Clearance, which would include removing the reactor building and Safestore structure, would effectively return the views from the Stolford village to open space.

Significance of effect

13.10.19. As the magnitude of change to this listed building group, a receptor of **High** sensitivity, resulting from change to setting of this monument is anticipated to be **Negligible**, the effects of the Preparations for Quiescence, would be Minor Adverse and therefore **Not Significant**. During the Quiescence phase effects are anticipated to be **Minor Adverse** owing to visibility of the Safestore, and **Not Significant**. At the end of Final Site Clearance, the Safestore will disappear from view which would be a negligible change in setting for the asset, resulting in a **Minor Beneficial** and therefore **Not Significant** effect.

13.11 Assessment of cumulative effects

Intra-project effects

13.11.1. There is the potential for historic environment effects associated with the Proposed Works to interact with or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

13.11.2. An assessment of inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Inter-project effects

13.11.3. Effects including noise, landscape and visual have been considered inherently within the settings assessment. A summary of the potential intra-project effects is also provided in **Chapter 21: Cumulative Effects Assessment.**

13.12 Summary

13.12.1. The results of the assessment of effects of the Proposed Works on the Historic Environment are summarised in **Table 13-13.**

Table 13-13 - Summary

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Phase	Magnitude of Change	Significance	Summary of Rationale
HPB buildings	Demolition of ancillary buildings, Safestore construction to reactor and eventual demolition of same through Final Site Clearance.	Low	Preparations for Quiescence	Low	Not Significant (Minor adverse)	Complete removal of a facility with a limited historic interest for the history of UK energy generation and associated architecture, with appropriate mitigation through building recording.
			Quiescence	None	No Effect	
			Final Site Clearance	High	Not Significant (Minor adverse)	
Scheduled round cairn known as Pixie's Mound (NHLE 1006226; 268 m south-west of the Works Area)	Change of visual element of reactor in views through Safestore construction and eventual removal through Final Site Clearance.	High	Preparations for Quiescence	Negligible	Not Significant (Minor Adverse)	Minimal change to the experience of the receptor through appreciation of its setting; the general utilitarian appearance/sense of the reactor structure will remain unchanged until removal.
			Quiescence	Negligible	Not Significant (Minor Adverse)	
			Final Site Clearance	Negligible	Not Significant (Minor Beneficial)	
Grade II listed Zine Farmhouse	Change of visual element of reactor in views through Safestore construction and	High-Medium	Preparations for Quiescence	Negligible	Not Significant (Minor Adverse)	Negligible change to the experience of the receptor through

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Phase	Magnitude of Change	Significance	Summary of Rationale
(NHLE 1175753; 1.30 km south-east of the Works Area)	eventual removal through Final Site Clearance.		Quiescence	Negligible	Not Significant (Minor Adverse)	appreciation of its setting; the general utilitarian appearance/sense of the reactor structure will remain unchanged until removal.
			Final Site Clearance	Negligible	Not Significant (Minor Beneficial)	
Stolford Group. Grade II listed Sea View, Stolford Farmhouse, and D'Arches (NHLE 1057379, 1057378, 1308209); 1.55 km east of the Works Area).	Change of visual element of reactor in views through Safestore construction and eventual removal through Final Site Clearance.	High-Medium	Preparations for Quiescence	Negligible	Not Significant (Minor Adverse)	Minimal change to the experience of the receptor through appreciation of its setting; the general utilitarian appearance/sense of the reactor structure will remain unchanged until removal.
			Quiescence	Negligible	Not Significant (Minor Adverse)	
			Final Site Clearance	Negligible	Not Significant (Minor beneficial)	

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14

Landscape and Visual Impact Assessment (LVIA)

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14 Landscape and Visual Impact Assessment (LVIA)

14.1 Introduction

14.1.1. This chapter assesses the landscape and visual effects of the Proposed Works. It should be read in conjunction with the description of the Proposed Works as presented in **Chapter 2: The Decommissioning Process**. It describes the key receptors, in relation to the Hinkley Point B (HPB) Nuclear Site Licence Boundary (hereafter referred to as 'the Site') and the Indicative Dismantling Works Area (the 'Works Area').

14.1.2. The Landscape and Visual Impact Assessment (LVIA) and Cumulative Effects Assessment (CEA) reported in this chapter have been produced by chartered landscape architects at WSP. The objective of this assessment has been to determine landscape and visual effects of the Proposed Works on the existing landscape resource and visual amenity.

14.1.3. This chapter is supported by **Figures 14.1** – **14.18**:

- **Figure 14.1**: LVIA Study Area;
- **Figure 14.2**: Zone of Theoretical Visibility and viewpoint locations;
- **Figure 14.3**: Areas of woodland depicted on Vectormap District;
- **Figure 14.4** – **Figure 14.14**: Baseline views from Viewpoint 1 – Viewpoint 10;
- **Figure 14.15**: Recreational routes and destinations;
- **Figure 14.16**: National Character Areas;
- **Figure 14.17**: Local Landscape Character Areas; and
- **Figure 14.18**: Landscape designations**.**

14.1.4. And is accompanied by the following technical appendices:

- **Appendix 14A**: LVIA Methodology;
- **Appendix 14B**: Viewpoint Assessment;
- **Appendix 14C**: Landscape and Visual Survey Report (which includes a set of Viewpoint Photography Record Sheets in Annex A); and
- **Appendix 14D**: Effects on Visual Receptors**.**

14.2 Relevant legislation, policy and technical guidance

Legislation

14.2.1. The legislation presented in **Table 14-1** is relevant to the assessment of the effects on LVIA receptors.

Table 14-1 - Legislation relevant to the LVIA

Legislation	Legislation Issue
The European Landscape Convention[1] (ELC)	The ELC is a Council of Europe initiative that provides a broad framework for landscape planning and management across all member states including the UK, which ratified the ELC in 2007. The ELC defines landscape as, "*an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors*" and is committed to several core principles and actions. The status of this convention is not affected by Brexit. These commitments are implemented by existing domestic policy and legislation rather than through any ELC-specific framework. The LVIA considers the character of the local landscape and how this may be affected by the Proposed Works.

Policy

14.2.2. A summary of the policies relevant to landscape and visual amenity is provided in **Table 14-2.**

Table 14-2 - Policy relevant to the LVIA

Policy reference	Policy relevance
National policy	
National Planning Policy Framework (NPPF)[2]	The NPPF sets out the Government's planning policies for England, and *"provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner*". Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it provides advice for achieving sustainable development, including consideration of landscape and visual amenity impacts. Chapter 12: Achieving well-designed and beautiful places Paragraph 135 records that planning policies and decisions should ensure that developments should (amongst other criteria): *'(b) visually attractive as a result of good architecture, layout and appropriate and effective landscaping*'; and *(c) are sympathetic to local character and history, including the surrounding built environment and landscape setting, while not preventing or discouraging appropriate innovation or change*'. Chapter 15: Conserving and enhancing the natural environment Paragraph 180 requires that planning policies and decisions should contribute to and enhance the natural and local environment by (amongst other criteria):

1 Council of Europe. (2000). *European Landscape Convention*. (online). Available at: https://rm.coe.int/CoERMPublicCommonSearchServices/DisplayDCTMContent?documentId=09000016802f80c6 (Accessed August 2024)

2 Department for Levelling Up, Housing and Communities. (2023). *National Planning Policy Framework*. (online). Available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2 (Accessed August 2024)

Policy reference	Policy relevance
	'(a) protecting and enhancing valued landscapes…..(in a manner commensurate with their statutory status or identified quality in the development plan); *(b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland'.* Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above policies, these need to be considered in the context of the application.
Planning Practice Guidance - Natural Environment[3]	The PPG reinforces the NPPF in stating that plans should recognise the intrinsic character and beauty of the countryside, and that strategic policies should provide for the conservation and enhancement of landscapes. This can include nationally and locally designated landscapes but also the wider countryside.
Local Policy	
Somerset Waste Core Strategy[4]	Policy DM3: Impacts on the environment and local communities This policy states that planning permission will be granted for waste management development subject to the applicant demonstrating that the proposed development will not generate (amongst other criteria), significant adverse impacts from visual intrusion to adjoining land uses and users and those in close proximity to the development and significant adverse impacts on a public right of way or visual amenity. It also states that planning permission for waste management development that would have a significant adverse impact on the integrity, character and/or setting of special landscape areas and landscape features of importance will not be granted. DM4: Site restoration and aftercare Restoration and aftercare measures should be implemented at the earliest practicable opportunity for waste management development which does not constitute a permanent use of land. Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above, these need to be considered in the context of the application.

3 Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government. (2019). *National Planning Practice Guidance –Natural Environment*. (online). Available at: https://www.gov.uk/guidance/natural-environment#landscape (Accessed August 2024)

4 Somerset County Council (2013). *Somerset Waste Core Strategy.* (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/minerals-and-waste-planning/ (Accessed August 2024)

Policy reference	Policy relevance
Adopted West Somerset Local Plan to 2032[5]	Policy NH5: Landscape Character Protection Policy NH5 relates to landscape character and states that development should be located and designed in such a way as to minimise adverse impact on the quality and integrity of that local landscape character area. Policy NH13: Securing high standards of design This policy requires all proposals for new development to demonstrate that, where appropriate and in addition to other criteria: ▪ *'An analysis of the constraints and opportunities of the site and its surroundings have informed the principles of design and how the detailed design responds positively to its neighbours and the local context;* ▪ *The proposal makes a positive contribution to the local environment and creates a place with a distinctive character; and* ▪ *The landscape proposals have been developed to enhance both the natural and built environment and maximise the potential to improve local biodiversity.'* Policy NH14: Nationally Designated Landscape Areas Policy NH14 notes that where development is likely to affect the Quantock Hills Area of Outstanding Natural Beauty (AONB)[6], regard will be given to its statutory purposes. The policy continues '*Development which would conflict with the achievement of the statutory purposed of the AONB or its setting will not be permitted*.' The Quantock Hills AONB lies outside of the Study Area for the Proposed Works and its defined Special Qualities would not be significantly affected
Taunton Deane Core Strategy 2011-2028[7]	Policy CP8: Environment Policy CP8 notes (amongst other criteria) that development will need to '*mitigate and where necessary, compensate for adverse impacts on landscape, ……. so that there are no residual effects.*' The policy continues by stating that development of settlement boundaries will be permitted where it will be '*appropriate in terms of scale, siting and design*' and '*protect, conserve or enhance landscape and townscape character whilst maintaining green wedges and open breaks between settlements*'. Policy DM 1: General Requirements Proposals for development, taking account of any mitigation measures proposed, will be required to meet a number of criteria including '*The appearance and character of any affected landscape, settlement, building or street scene would not be unacceptably harmed by the development*.'

5 West Somerset Council (2016). *Adopted West Somerset Local Plan to 2032*. (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton (Accessed August 2024)

6 Areas of Outstanding Natural Beauty (AONBs) became National Landscapes on 22nd November 2023. For the purposes of this chapter, all references to AONBs made in extant planning policy documents and when quoting consultation responses will continue to refer to AONB. For all other references, the term National Landscapes will be used.

7 Taunton Deane Borough Council (2012). *Taunton Deane Core Strategy 2011-2028*. (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Somerset+West+and+Taunton (Accessed August 2024)

Policy reference	Policy relevance
Sedgemoor Local Plan 2011-2032[8]	Whilst the Proposed Works do not lie within Sedgemoor District, the south-eastern fringes of the LVIA Study Area covers a small part of the district. Policy D19: Landscape Policy D19 requires that development proposals ensure that there is '*no significant adverse impact on local landscape character, historic landscape, scenic quality and distinctive landscape features as identified in the Sedgemoor Landscape Assessment and Countryside Design Summary'*. The policy requires that an LVIA accompanies planning applications where it is judged that the landscape and visual amenity may be adversely affected by the proposed development.

Technical guidance

14.2.3. The LVIA has been undertaken in accordance with the third edition of the Guidelines for Landscape and Visual Impact Assessment[9] (hereafter referred to as GLVIA3) produced by the Landscape Institute and the Institute of Environmental Management and Assessment. GLVIA3 is widely regarded by landscape and planning professions as the 'industry standard' together with best practice guidance and professional judgement. The LVIA also takes account of the technical notes published by the Landscape Institute, as set out in **Table 14-3**.

Table 14-3 - Technical Guidance relevant to the LVIA

Technical Guidance	Context
Technical Guidance Note 06/19 Visual Representation of Development Proposals[10]	Provides supplementary guidance to GLVIA3 as to appropriate techniques to capture site photography and the selection, production and presentation of types of visualisation appropriate to the circumstances in which they will be used.
Technical Information Note 01/2017 (Revised). Tranquillity – an overview[11]	Provides an overview of what is understood by the term 'tranquillity' within the landscape profession.
Technical Guidance Note 02/21 Assessing landscape value outside national designations[12]	Provides information and guidance to landscape professionals and others who need to make judgments about the value of a landscape (outside national landscape designations) in the context of the UK Town and Country Planning system.

8 Sedgemoor District Council (2019). *Sedgemoor Local Plan 2011-2032.* (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/adopted-local-plans/?district=Sedgemoor (Accessed August 2024)

9 Landscape Institute and Institute of Environmental Management & Assessment (LI and IEMA). (2013). *Guidelines for Landscape and Visual Impact Assessment. 3rd Ed. Third Edition*. Routledge, London and New York.

10 Landscape Institute (2019). *Technical Guidance Note 06/19 Visual Representation of Development Proposals.* (online). Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2019/09/LI_TGN-06-19_Visual_Representation.pdf (Accessed August 2024)

11 Landscape Institute (2017). *Tranquillity – An overview Technical Information Note 01/2017 (Revised).* (online). Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2017/02/Tranquillity-An-Overview-1-DH.pdf (Accessed August 2024)

12 Landscape Institute (2021). *Technical Guidance Note 02/21 Assessing landscape value outside national designations.* (online). Available at: https://landscapewpstorage01.blob.core.windows.net/www-landscapeinstitute-org/2021/05/tgn-02-21-assessing-landscape-value-outside-national-designations.pdf (Accessed August 2024)

Technical Guidance	Context
Draft Technical Guidance Note 05/23 Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3)[13]	Draft version subject to consultation which closed in September 2023. Provides a compilation of clarifications on the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3) and produced to help interpret aspects of the guidance. It is intended that the Technical Guidance Note be read alongside GLVIA3.

14.2.4. The LVIA methodology, which accords with the technical guidance is set out in detail in **Appendix 14A**.

14.3 Data gathering methodology

Study Area

14.3.1. The selection of the LVIA Study Area has been undertaken in accordance with guidance set out in Sections 5.2 and 6.2 in GLVIA3[9] which places an emphasis on a '*reasonable approach which is proportional to the scale and nature of the proposed development*' and the findings of the field survey. The definition of the Study Area has been informed by the extent of the Zone of Theoretical Visibility map (ZTV) generated for the tallest, long-term component of the Proposed Works (i.e. the maximum Safestore structure height which is assumed to be 66.5 m above ground level (AGL)), described below, the nature of the Proposed Works and by the landscape and visual context described in **Section 14.5.**

14.3.2. At scoping stage, an initial LVIA Study Area was defined to include a 5 km offset from the Site to ensure that the LVIA considered receptors that have the most potential to be significantly affected by the Proposed Works. Paragraph 13.6.4 of the Scoping Report states '*Further refinement of visual receptors (residential, recreational and vehicular receptors) for inclusion in the LVIA will be carried out as part of the assessment process through an analysis of the conclusions of a Viewpoint Assessment undertaken at each of the agreed viewpoints…*'

14.3.3. Viewpoint assessment has provided a detailed assessment of the likely visual effects arising from the Proposed Works within the defined Works Area which incorporates the Site and coastal / marine works including the dismantling of the cooling water intake structure. The viewpoint analysis in **Appendix 14B** indicates that potentially significant visual effects resulting from the Proposed Works could occur for receptors within approximately 1.5 km of the Works Area particularly from within the low-lying coastal strip to the east of the Proposed Works. Taking a precautionary approach, drawing from best practice guidance, the Study Area has therefore been focused on receptors within 3 km offset of the Works Area. The initial ('scoping') and revised Study Areas are shown in **Figures 14.1** and **14.2**.

[13] Landscape Institute (2023). Draft Technical Guidance Note 05/23 Notes and Clarifications on aspects of the 3rd Edition Guidelines on Landscape and Visual Impact Assessment (GLVIA3). https://www.landscapeinstitute.org/wp-content/uploads/2023/07/GLVIA3-Notes-and-Clarifications.pdf (Accessed August 2024)

Desk study

14.3.4. The LVIA has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of data sources. The principal data sources used to inform this chapter comprise of the following:

- Ordnance Survey (OS) 1:25,000 scale mapping:
  - Explorer 140 – Quantock Hills & Bridgwater (or digital mapping).
- National Character Areas (NCA) profiles:
  - 142: Somerset Levels and Moors[14]; and
  - 146: Vale of Taunton and Quantock Fringes[15].
- West Somerset Landscape Character Assessment[16];
- Sedgemoor Landscape Assessment and Countryside Design Guide[17];
- Quantock Hills Area of Outstanding Natural Beauty Management Plan 2019-2024[18];
- Seascape Character Assessment for the South West Inshore and Offshore marine plan areas[19];
- Multi-Agency Geographic Information for the Countryside (MAGIC)[20];
- Light pollution and dark skies mapping produced by LUC for CPRE[21];
- Somerset Public Rights of Way maps[22];
- Aerial Photography (Google Earth Pro – imagery date August 2021) and Street View; and
- LVIA (Chapter 22) prepared for the Hinkley Point C Development Site (Environmental Statement - Volume 2)[23] and associated figures.

Zone of Theoretical Visibility

14.3.5. A ZTV has been generated to illustrate the extent of potential visibility of the Proposed Works and informed the selection of viewpoints. The ZTV is defined in GLVIA3[9] as '*a map, usually digitally*

14 Natural England (2013). National Character Area Profile 142: Somerset Levels and Moors (NE451). (online). Available at: https://publications.naturalengland.org.uk/publication/12320274?category=587130 (Accessed August 2024)

15 Natural England (2014). National Character Area Profile 146: Vale of Taunton and Quantock Fringes (NE550). (online). Available at: https://publications.naturalengland.org.uk/publication/6601735426539520?category=587130 (Accessed August 2024)

16 WS Atkins. (1999) West Somerset Landscape Character Assessment. (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/evidence-base-and-monitoring/environmental-evidence-base/?district=Somerset+West+and+Taunton (Accessed August 2024)

17 Sedgemoor District Council (2003). Sedgemoor Landscape Assessment and Countryside Design Guide. (online). Available at: https://www.somerset.gov.uk/planning-buildings-and-land/supplementary-planning-documents/

18 Quantock Hills Joint Advisory Committee (2019). Quantock Hills Area of Outstanding Natural Beauty Management Plan 2019-2024. (online). Available at: Management Plan 2019-2024 (quantockhills.com) (Accessed August 2024)

19 Marine Management Organisation (2018). MMO 1134: Seascape Character Assessment for the South West Inshore and Offshore marine plan areas. (online). Available at: https://www.gov.uk/government/publications/seascape-assessments-for-north-east-north-west-south-east-south-west-marine-plan-areas-mmo1134 (Accessed August 2024)

20 Natural England (2023). Multi-Agency Geographic Information for the Countryside. (online). Available at: https://magic.defra.gov.uk/home.htm (Accessed August 2024)

21 Natural England (2016). England's Light Pollution and Dark Skies Mapping. (online). Available at: https://www.cpre.org.uk/light-pollution-dark-skies-map/ (Accessed August 2024)

22 Somerset Council (2023). Explore Somerset. (online). Available at: https://roam.somerset.gov.uk/roam/map

23 EDF Energy (2011). Hinkley Point C Development Site. Environmental Statement – Volume 2.(Online). Available at: layout (nationalarchives.gov.uk). (Accessed August 2024)

produced, showing areas of land within which a development is theoretically visible'[9] and represents the desk top component of the visibility analysis.

14.3.6. The ZTV presented in **Figure 14.2** has been calculated using specialist software together with a Digital Terrain Model (DTM) (OS Terrain 5) and height for the tallest component of the Proposed Works i.e. the Safestore (which will house the redundant reactor building) at a maximum height of 66.5 m AGL (based on recladding of the existing reactor building). The DTM represents the topographic constraints on the visual influence of the Proposed Works at a maximum height of 66.5 m but does not take account of the built elements or vegetation within the Study Area, both of which can significantly reduce the area and extent of actual visibility. As a consequence, the DTM data has been amended to include areas of woodland within the Study Area as depicted in OS VectorMap District to allow their screening effect to be incorporated in the preliminary ZTV calculation. A height of 12 m AGL has been used for these areas of woodland, the location and extent of which is shown in **Figure 14.3**.

14.3.7. It should be noted that the ZTV presented in **Figure 14.2** does not include the potential screening effects of landscape components other than woodland, such as buildings, walls, fences, hedgerows, or individual trees, that may affect visibility. An understanding of the role these landscape components play in influencing visibility was therefore obtained during the field survey and is evidenced in the viewpoint photography in **Figures 14.4** to **14.14.**

14.3.8. Similarly, the ZTV does not include the future landform and vegetation which forms part of the mitigation measures associated with the Hinkley Point C (HPC) development. An understanding of the role of these components has been informed by the Landscape Restoration/Habitats Plan and visualisations reported in the Environmental Statement - Volume 2 for the Hinkley Point C Development Site[23].

Field Survey

14.3.9. A field survey was completed in February 2022 to obtain viewpoint photography at the viewpoint locations agreed with Somerset County Council (SCC)[24] during engagement via email in December 2021 (see **Section 14.4**). Photography was undertaken during the winter months thereby reflecting the maximum visibility scenario in accordance with paragraph 4.3 of GLVIA3[9]. The viewpoint schedule is set out in

[24] Somerset Unitary Authority was created in April 2023 and replaces Somerset County Council. The new unitary council brings together the services previously provided by the four district councils in Somerset (Mendip, Sedgemoor, Somerset West and Taunton, and South Somerset) alongside the services formerly provided by Somerset County Council. Where text refers to Somerset County Council, these discussions occurred prior to April 2023.

14.3.10. **Table** 14-6**.**

14.3.11. A further field survey was undertaken in July 2024 to obtain photography from an additional viewpoint on the King Charles III England Coast Path to the north of HPB, at the request of Somerset Council.

14.3.12. The resultant photographs from the viewpoints have been digitally joined (using Autopano Giga software) to form a panorama and the annotated panoramic photographs have been presented as Type 1 Annotated Viewpoint Photographs in accordance with best practice guidelines set out in the *Landscape Institute's Technical Guidance Note 06/19 Visual Representation of Development Proposals*[10].

14.3.13. A description of the baseline views available from the agreed viewpoint locations is included in the Viewpoint Assessment in **Appendix 14B**.

Viewpoint selection criteria

14.3.14. Viewpoint selection was informed by the desk survey with regards to access and recreation (including promoted walking and cycling routes), tourism including popular vantage points and destinations, and distribution of population and through consultation with SCC in December 2021. Paragraph 6.20 of GLVIA3[9] describes how the selection of viewpoints should take account of a range of factors including:

- *'The accessibility to the public;*
- *The potential number and sensitivity of the viewers who may be affected;*
- *The viewing distance (i.e. short-, medium- and long-distance views) and elevation;*
- *The nature of the viewing experience (for example static views, views from sequential points along routes); and*
- *The view type (for example panoramas, vistas and glimpses)'*[9].

14.3.15. In addition to the criteria list above, viewpoint selection is primarily concentrated on those visual receptors whose activities are influenced by the availability and quality of views (e.g. users of the promoted recreational routes), or where a sense of place is particularly important to the setting of a settlement. GLVIA3[9] describes how viewpoints selected for inclusion fall broadly into three groups as follows:

- *'representative viewpoints, selected to represent the experience of different types of visual receptor, where larger numbers of viewpoints cannot all be included individually and where the significant effects are unlikely to differ – for example, certain points may be chosen to represent the views of users of particular public footpaths and bridleways;*
- *specific viewpoints, chosen because they are key and sometimes promoted viewpoints within the landscape, including for example specific local visitor attractions, viewpoints in areas of particularly noteworthy visual and/or recreational amenity such as landscapes with statutory landscape designations, or viewpoints with particular cultural landscape associations; and*
- *illustrative viewpoints, chosen specifically to demonstrate a particular effect or specific issues, which might, for example, be the restricted visibility at certain locations'.*[9] *This may occur where a highly sensitive visual receptor is shown as coinciding with the ZTV but would not be affected, or conversely where particularly unrestricted views are available.*

Viewpoint photography

14.3.16. All photography was undertaken in accordance with the specification for Type 4 photography set out in the *Landscape Institute's Technical Guidance Note 06/19: Visual Representation of Development Proposals*[10]. Type 4 uses the highest specification of recording and photographic equipment of the four types defined in Technical Guidance Note 06/19.

14.3.17. All photographs presented in the figures accompanying the LVIA (**Figures 14.4** to **14.14**) have been taken using:

- A high-resolution digital single-lens reflex (SLR) camera with a 'full frame' sensor (i.e. 36 x 24 mm) with the camera set at 1.5 m AGL;
- A 50 mm fixed focal length (prime) lens; and
- A professional quality tripod fitted with a panoramic head.

14.3.18. Accurate locations were established using a hand-held Global Positioning System (GPS) unit and recorded on a standardised proforma. The proforma also allowed for other data to be captured, as follows:

- The date and time when the viewpoint was visited/photography taken;
- A description of the exact location; and
- Other observational comments regarding the viewpoint location including as to whether relocation was required due to the presence of immediate foreground screening which restricted views in the direction of the development, recording key reference points in the view etc. The proforma also provided a useful record of observations made in relation to landscape condition and perceptual aspects (such as remoteness and tranquillity) which are not always readily available from published sources. These are included in Annex A of the Decommissioning of HPB Landscape and Visual Survey Report presented in **Appendix 14C** which accompanies this LVIA.

14.3.19. In addition to the viewpoint records, there were a number of other important criteria considered when obtaining the viewpoint photography:

- Ensuring photography was undertaken on a dry, clear day with good visibility (weather and visibility is recorded on the proforma in Appendix A of the Decommissioning of Hinkley Point B Landscape and Visual Survey Report);
- Ensuring locations were visited from east to west as the day progressed to avoid shooting into the sun and avoiding low sun; and
- Avoidance of foreground clutter in the view.

Data limitations

14.3.20. As is usual practice, representative locations have been selected as viewpoints to inform the LVIA since it would be disproportionate to include photography from all locations within the Study Area from which the Proposed Works would potentially be visible.

14.3.21. All viewpoints are publicly accessible locations in accordance with paragraph 6.20 of GLVIA3[9], and areas that are not publicly accessible are therefore not included in the viewpoint assessment.

14.3.22. As a consequence of the construction of HPC, views have and will continue to change up until the operational phase of HPC. As a consequence of these on-going changes, the viewpoint photography can only provide an indication of the view at a specific point in time and provides an indication of the location and extent of HPC. However, HPA and HPB remain static and their visual role in the landscape, and that of the surrounding woodland, is accurately captured.

14.4 Consultation

Overview

14.4.1. The assessment has been informed by consultation responses and statutory and technical engagement.

Pre-application Opinion

14.4.2. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the LVIA assessment and confirmation of how these are addressed by the assessment is included in **Table 14-4**.

Table 14-4 - Summary of Pre-application Opinion Responses

Paragraph Ref	Consideration	How addressed in the ES
59	In Chapter 13 (Landscape and Visual Impact Assessment) it was noted in the consultation responses that the relevant District Council should also be consulted in addition to the County Council as they will be the Local Planning Authority.	The relevant District Council (Somerset West & Taunton) was abolished in 2023 and joined with Somerset County Council and other district councils to form a unitary authority - Somerset Council. Therefore, further consultation with the District Council is not feasible. However, further engagement has been held with Somerset Council and an additional viewpoint added from the King Charles III England Coast Path to the north of HPB, at the request of Somerset Council.
Appendix 2, Table row 9	In Section 3.1.4 there is no mention of night-time lighting. The 'Preparations for Quiescence Phase' description (paragraph 2.3.7) states that 'site security lighting during this phase will remain largely as it has been in operation. The working hours make it likely that some site lighting may be required to undertake work safely in winter', the lighting would therefore reduce during the Quiescence Phase and likely reduce adverse effects and improve the landscape and visual amenity. This should be considered in the EIA.	Effects associated with night-time lighting are considered in the LVIA where relevant.

Paragraph Ref	Consideration	How addressed in the ES
Appendix 2, Table row 10	In Chapter 13 (Landscape and Visual), a viewpoint from the AONB has not been considered and therefore there is insufficient evidence to determine if scoping this receptor out of the EIA is suitable. The EIA should reconsider effects on this receptor. In addition to this, the scoping report has not considered viewpoints from close to the station.	The viewpoint assessment contained within **Appendix 14B**, which includes the elevated views available from Viewpoint 10 (**Figure 14.13**), the closest viewpoint to the AONB (located approximately 0.9 km to the east of the AONB boundary), provides the evidence for scoping out consideration of the effects on the AONB. Further justification is provided in **Section 14.9**. Viewpoints 1 and 2 represent locations in close proximity to HPB and are from public footpaths 450m and 900m from the reactor building respectively. The Public Right of Way (PRoW)/King Charles III England Coast Path which follows a route to the north of the reactor building was closed at the time of the field survey as part of the HPC construction works. Views from this section of route have however, been duly considered as part of the visual assessment and the absence of a photographic viewpoint does not undermine the validity of the LVIA.

Non-statutory consultation

14.4.3. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

14.4.4. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

14.4.5. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. Comments relevant to the landscape and visual impact assessment are summarised in **Table 14-5.**

Table 14-5 – Comments received during non-statutory consultation relevant to the landscape and visual impact assessment

Respondent	Comment received	Response from the Applicant
Round 1 consultation		
Sedgemoor District Council	Support for the Landscape and Visual Impact Assessment methodology, noting that it appeared to follow best practice. Suggestion that the end of the Project should result in benefits compared to the current position and agreed that the three Landscape Character Areas in the Sedgemoor area do not require further assessment.	Thank you for your comment, we welcome your support for the Landscape and Visual Impact Assessment methodology.
Round 2 consultation		
Somerset Council	Suggestion that the Landscape and Visual assessment should have chosen a viewpoint close to the HPB station.	An additional viewpoint close to the HPB station has been included in the Landscape and Visual assessment.
Somerset Council	Request to include a viewpoint from the King Charles III England Coast Path within the Landscape and Visual assessment.	
Somerset Council	Concern about the use of aluminium cladding for the Safestore, and the visual impact this may have.	The Project has assumed that the aluminium cladding used on the Safestore will be coated. It is assumed the cladding will be coated a light grey colour e.g. goosewing grey or similar, which is similar to the existing landscape setting.

Technical Engagement

14.4.6. Preliminary technical engagement was undertaken with Somerset County Council in December 2021 to agree the location of viewpoints from which to obtain baseline photography as part of the Landscape and Visual Survey Report for the Proposed Works (**Appendix 14C**) which in turn was used to inform the scope of the LVIA. Further technical engagement in May 2024 with Somerset Council resulted in the request for an additional viewpoint photograph from the King Charles III Coast Path, directly north of the Site, to support the LVIA. This is provided in viewpoint 1a (see **Figure 14.5**). The photography was obtained under winter conditions (thereby reflecting a worst-case scenario) from the viewpoints set out in **Table 14.6** The viewpoints are show in **Figure 14.2**.

Table 14-6 - Viewpoint selection

Viewpoint (VP) reference	Location	Grid reference	GLVIA3 Typology and selection justification
VP1	King Charles III England Coast Path on the western side of Wick Moor	321679, 145728	Representative Viewpoint – One of the closest and most open publicly accessible locations with views indicative of those available to users of the inland section of the King Charles III England Coast Path and Wick Moor area of Open Access Land to the east of the Site. This location was included as Viewpoint 15 in the 2011 LVIA for HPC.
VP1a	King Charles III England Coast Path to the north of HPB	321423, 146345	Specific Viewpoint – The closest publicly accessible location to the north of the Site, with the location specifically selected to present the most open (and worst-case) view from the King Charles III Coast Path.
VP2	King Charles III England Coast Path within Wick Moor close to Wick Moor Drove	320767, 145366	Representative Viewpoint – Another close and open publicly accessible location with views indicative of those available to users of the inland section of the King Charles III England Coast Path and Wick Moor area of Open Access Land to the south-west of the Site.
VP3	PRoW WL 23/62 at the southern end of Wick Moor	321834, 144788	Representative Viewpoint – Views available to users of a local footpath network within the Wick Moor area of Open Access Land close to the settlement of Wick to the south-east of the Site.
VP4	King Charles III England Coast Path close to the settlement of Stolford	322929, 145982	Representative Viewpoint – Views available to users of the King Charles III England Coast Way and potentially residents in Stolford to the east of the Site. This location was included as Viewpoint 19 in the 2011 LVIA for HPC
VP5	Minor road to the south of the Site (near Gunter's Grove)	320980, 144246	Representative Viewpoint – Middle-distance views available to drivers and their passengers travelling along a minor road to the south of the Site close to Gunter's Grove.

Viewpoint (VP) reference	Location	Grid reference	GLVIA3 Typology and selection justification
			This location was included as Viewpoint 12 in the 2011 LVIA for HPC.
VP6	PRoW WL 23/23 on the north side of the settlement of Stogursey	320231, 143158	Representative Viewpoint – Middle-distance views available to users of a local PRoW and residents on the northern edge of Stogursey to the south south-west of HPB.
VP7	PRoW BW 32/1 at Stockland Bristol	324037, 143676	Representative Viewpoint – Middle-distance views available to users of a local PRoW and residents at Stockland Bristol to the south-east of HPB.
VP8	King Charles III England Coast Path to the west of Hinkley Point	316683, 145443	Specific Viewpoint – Views available to eastbound users of the King Charles III England Coast Path selected to demonstrate the future baseline role of HPC in views from coastal locations to the west.
VP9	PRoW BW 25/7/River Parrett Trail/England Coast Path within Steart Marshes	326092, 144668	Representative Viewpoint – Views available to users of a promoted trail (River Parrett Trail) which coincides with a national trail (King Charles III England Coast Path) within Steart Marshes, a visitor attraction with open views along the coastline.
VP10	PRoW BW 24/3 north of Stringston	317091, 143042	Representative Viewpoint – Long-distance views available to users of a local footpath which crosses elevated land to the south-west of HPB. This location was included as Viewpoint 5 in the 2011 LVIA for HPC.

14.4.7. Photography from an eleventh viewpoint was also captured on the seafront promenade close to South Esplanade, Burnham on Sea (grid reference 330289, 148734) at the request of SCC. Whilst this viewpoint lies outside of the LVIA Study Area set out in **Section 14.3**, it was included in the baseline survey to demonstrate the influence of separation distance from HPB on views (e.g. the scale of the built form and level of detail which is available at such distances) and to confirm the appropriateness of the initially proposed 5 km LVIA Study Area.

14.4.8. The field survey recorded that the reactor building at HPB is identifiable as a distant visual component from this location, occupying a narrow proportion of the wide panoramic views whilst the

lower height ancillary buildings located close to the more open northern boundary of the Site are not readily discernible in baseline views due to the separation distance (9.2 km). Consideration of the baseline visual role of HPB and the scale of the Proposed Works has concluded that significant visual effects would not occur at this viewpoint, and it will therefore not be considered further in the LVIA.

14.5 Overall baseline

Current baseline

Hinkley Point B Power Station site

14.5.1. The land within the Site boundary lies at an elevation of approximately 10 m Above Ordnance Datum (AOD) and predominantly features built form including the large-scale building housing the reactors and adjoining turbine hall towards the centre of the Site, and an expansive range of smaller ancillary buildings, warehouses and tanks. These are set within operational land-uses comprising access tracks, car parking and substation compounds all bound by security fencing. Inside the security fence along the northern boundary, a high gabion wall prevents views across the Site from the adjoining Brean Down to Minehead section of the King Charles III England Coast Path which follows the coastline to the immediate north of Hinkley Point A (HPA) and B Power Stations.

14.5.2. Land outside of the double security fence boundary and Works Area, but within the Site boundary, comprises a mosaic of broadleaved and mixed plantation woodland, semi-improved neutral grassland, scrub, tall ruderal vegetation, and ephemeral/short perennial vegetation. The woodland wraps around the eastern and southern boundaries of the main operational land-uses and provides effective screening of the lower-level ancillary buildings and infrastructure within HPB.

Wider landscape and visual context

Topography and drainage

14.5.3. The landform of the Somerset coast forms a broad pattern of gently undulating land rising to form the foothills of the Quantock Hills National Landscape[6]. To the east of the Site the land becomes lower-lying, with flat open sedimentary deposits forming marshy grassland. The marshland landscape continues north-eastwards in a continuous belt along the shore to, and beyond, the River Parrett. The shore is dominated by wave cut platforms and mud banks that form an extensive intertidal zone. The foreshore is in places defined by shallow cliffs rising above the outcrops of Jurassic Blue Lias that are of geological significance. The Severn Estuary Special Area of Conservation (SAC), Ramsar Site and Special Protection Area (SPA) on which the headland of Hinkley Point lies is characterised by extensive mud flats and is internationally renowned as being valuable for wildfowl and waders.

14.5.4. A number of streams drain the lower foothills of the Quantocks and flow though the Study Area. These include the Stogursey Brook and Bayley's Brook which join Bum Brook to the north of Shurton. Bum Brook continues to Wick where it splits, forming the East Brook and West Brook, which run broadly parallel, finally discharging as West Brook into Bridgwater Bay north of Stolford. Elsewhere, Middle Brook joins North Brook north of Stockland Bristol, becoming South Brook and draining into the River Parrett to the east of the Study Area.

Land use and vegetation pattern

14.5.5. Immediately inland from the Site, the landcover is characterised by hedge-enclosed pastoral and cultivated land. These patterns extend up onto the lower slopes of the Quantock Hills to the south-west of the Site. The open patterns of the grazing marsh and coastal fringes contrast with the nearby hedge-enclosed, higher, cultivated land. Small to medium sized plantations, copses and woodlands are also prevalent across the more elevated land to the south of the Site.

Settlement pattern

14.5.6. Settlement patterns reflect the isolated nature of the coastal landscape. There are small villages located on the higher land to the south of the Site including the hamlets of Wick, Shurton, Burton and Knighton plus the larger village of Stogursey. The hamlet of Stolford lies to the east of the Site separated from the HPB station by the marshes of Wick Moor. On the Site there is minimal evidence of past settlement and activity, other than the access road, Wick Moor Drove, which continues to the shore in the form of remnant parallel banks within wooded areas. Human influence is however extensive on much of the coast, with sea defences and walls, land drainage and water level management structures and ditches, with hedges on the higher and drier land. Recent development includes the large-scale infrastructure project of HPC located immediately to the west of HPA with the HPC development site extending south towards the hamlets of Shurton, Burton and Knighton.

Recreational routes and destinations

National Trails

14.5.7. The 93 km Brean Down to Minehead section of the King Charles III England Coast Path and its associated Coastal Margin traverses the coastline to the north of HPB and continues to the east and west as shown in **Figure 14.15**. A 4.9 km inland alternative is currently in place to bypass construction works associated with HPC. Once the section of route has been re-opened (following completion of the HPC construction phase), the King Charles III England Coast Path will revert back to its original alignment and will pass to the north of the HPC, HPA and HPB stations.

Promoted routes

14.5.8. The West Somerset Coast Path connects the River Parrett Trail at the hamlet of Steart, with the South West Coast Path National Trail at Minehead and its route coincides with the King Charles III England Coast Path through the Study Area.

14.5.9. The regionally promoted Castles & Coast Way[25] also traverses the Study Area and its route is shown in **Figure 14.15**. This 13 km circular walk from Nether Stowey Castle to Stogursey Castle links The Coleridge Way and the King Charles III England Coast Path.

Local Public Right of Way network

14.5.10. The distribution of local Public Rights of Way (PRoWs) is illustrated in **Figure 14.15**. This shows a dense network of footpaths linking roads and settlements.

[25] Somerset County Council (undated). Castles & Coast Way. https://www.visitsomerset.co.uk/things-to-do/activities/walking/castles-coast-way (Accessed August 2024)

Open Access Land / Registered Common Land

14.5.11. An extensive tract of land to the south and east of HPB is designated as Open Access Land (under the Countryside and Rights of Way Act 2000) and Registered Common Land. This includes areas known as Wick Moor, North Moor, Great Hooks and Little Hooks and Ham to the immediate south and east of HPB and Sharpham, Redham and North Ham which extend to the west and north of Stolford. To the east of Stolford, Catsford Common and Wall Common form Registered Common Land but are not designated as Open Access Land.

Transport network

14.5.12. There are no 'A' or 'B' classified roads within the Study Area. A relatively dense network of minor roads and lanes link settlements and are often bound by high hedgerows thereby limiting the availability of views.

Night-time environment

14.5.13. CPRE's online light pollution and dark skies mapping[21] reflects data derived from satellite imagery gathered in September 2015 i.e. light sources as directly viewed from above. Reference to the mapping indicates that the levels of radiance across the HPA, HPB and HPC sites are at the highest (brightest) level on the spectrum (>32 NanoWatts / cm²/sr). Bands of decreasing levels of radiance extend in all directions from the three sites with moderate levels of radiance (1-2 NanoWatts / cm²/sr) remaining at Stolford to the east and Wick to the south of the Site. Moderate levels of radiance are also indicated within the larger settlement of Stogursey. Elsewhere, levels of radiance are typically towards the lower end of the spectrum (0.5-1 to 0.25-0.5 NanoWatts / cm²/sr) reflective of the rural landscape and increasing distance from settlements.

Landscape character

National Character Areas (NCAs)

14.5.14. At the national scale of Natural England's 159 NCAs, the Site boundary spans two NCAs. The reactor buildings and infrastructure within the western half of the Site lies within the eastern edge of NCA 146: Vale of Taunton and Quantock Fringes as illustrated in **Figure 14.16** whilst infrastructure located to the east of the reactor buildings lies within NCA 142: Somerset Levels and Moors. The published profile for NCA 146: Vale of Taunton and Quantock Fringes[15] notes in the opening summary that:

> *'Hinkley Point nuclear power station lies on the far eastern edge of the NCA, prominent in sweeping coastal views.'*[15]

14.5.15. The description section of the profile for NCA 146 expands the reference to the Power Stations further stating:

> *'In 1957 the construction began of Hinkley Point A nuclear power station at the north-eastern edge of the area. Subsequently Hinkley Point B was constructed. Hinkley Point A has stopped operating and Hinkley Point B is now reaching the end of its life. Planning permission has been given for a further two reactors, to be known as Hinkley Point C. This forms a prominent feature on the coast and in views from the Quantock Hills AONB. Mitigation works, landscaping, tree planting and habitat improvement, required for the planning permission, are being put in place.'*[15]

14.5.16. The pertinent key characteristics of NCA 146: Vale of Taunton and Quantock Fringes in relation to the Study Area are as follows:

- *'The topography can be divided into four distinct areas: the flood plain; a gentle low vale underlain by Triassic mudstones; a more elevated, undulating vale underlain by Devonian slates and sandstones as well as Triassic sandstones and mudstones; and the open, wind-swept cliffed coast underlain by Triassic mudstones, Jurassic mudstones and limestones and a small section of Pleistocene gravels.*
- *Open and wind-swept coast with low cliffs, mudflats and wave-cut platforms in mudstones and limestones. The often spectacularly folded and faulted Triassic and Jurassic mudstones and limestones that are visible on the extensive shore platforms and the cliffs are renowned for their fossils and are of international importance for their stratigraphy.*
- *A number of tree-lined streams wind through the area. To the east many streams drain off the Quantock dip slopes and flow into the River Parrett.*
- *Woodland cover is generally low, at 6 per cent, although the area has a wooded feel as there are many hedgerow trees (such as oak), orchards, remnants of parkland, small woodlands with ash and oak and bankside trees such as alder and, rarely, black poplar.*
- *Lowland mixed farming landscape, with dense hedgerows enclosing rectilinear fields. Permanent grassland characterises the flood plain with arable, pasture, market gardening and orchards in the vales and pasture and arable on more undulating ground.*
- *Scattered settlements of farmsteads, hamlets and villages linked by sunken winding lanes. Distinctive gentry architecture with parkland, local vernacular of red sandstone buildings and prominent Perpendicular church towers to the west and south, and grey Lias along the coast and to the east.*
- *Sweeping views from the coast across the bay to Wales; to Hinkley Point power station in the east; and to Minehead in the west. Exmoor, the Blackdown Hills and the Quantock Hills provide a backdrop to the area and expansive views from these uplands emphasise the lush pastoral nature of this area.'*[15]

14.5.17. The pertinent key characteristics of NCA 142: Somerset Levels and Moors which covers the eastern part of the Site and low-lying land within the Study Area are as follows:

- *'This is a flat open landscape of wet pasture, arable and wetland divided by ditches and rhynes, often forming a chequer-board pattern, that clearly illustrate the reclaimed, planned nature of the landscape.*
- *The area includes the largest lowland grazing marsh system in Britain.*
- *Rivers draining into the Levels and Moors include the Axe, Brue, Parrett, Yeo and Isle. Most of the area is susceptible to flooding, lying below high tide level and the water level of the main, embanked river systems.*
- *Semi-natural unimproved grasslands, wet meadows, fen, mire and reedbeds underline the area's wetland character, which is internationally important for assemblages of wetland and wading birds, invertebrates, amphibians, wetland mammals, and the aquatic vegetation of the rhynes and ditches.*
- *Reflecting the history of reclamation, roads on the Levels are often sinuous, following the line of rhynes that were once salt marsh creeks; others are straight droves, causeways and flood*

embankments, slightly raised and related to the drainage channels of the 18th-century landscape of the inland Moors.

- *The coast fringing Bridgwater Bay is complex and various: dunes extend from Brean Down southwards to Burnham-on-Sea, embankments hug the coastline south of Highbridge, and either side of the Parrett estuary there are mudflats, sand flats, storm shingle beaches and salt marsh. Manmade defences have been created to keep high tides at bay and are a dominant feature of the coastal scene'*[14].

14.5.18. Whilst '*wide panoramic views both from inside the area looking out and from outside the area looking in*'[14, 15]are cited in the description for this NCA, HPB is not noted as forming a feature in these views.

District-level landscape character

14.5.19. At a district level, the Site is located within the Quantock Vale Landscape Character Area (LCA) as defined in the *West Somerset Landscape Character Assessment*[16] and shown in **Figure 14.17**. This LCA covers a lowland landscape of wider valleys and gentle hills which are rarely over 60 m AOD overlain by an essentially ancient agricultural landscape of small fields, hedges, hedgerow trees and small woodlands. The presence of two small areas of marsh and the coast have led to the Quantock Vale LCA being divided into four sub-areas with the Site being within the Eastern Lowlands Sub-Area. The key characteristics of the Eastern Lowlands Sub-Area, are defined as follows:

- *'Field Pattern;*
- *Deciduous Woodland;*
- *Hedges and hedgerow trees; and*
- *Hinkley Point and the power lines'*[16].

14.5.20. Of relevance to HPB, the West Somerset Landscape Character Assessment states:

> *'Hinkley Point power station is a notable modem development in the area. Given the lie of the land and vegetation it is not as visually dominant from within the area as might be expected, although it is a significant feature in views of the area from the Quantock Hills. The power lines in the east are locally dominant features'*[16].

14.5.21. The landscape to the south and east of the Site is defined as the Wick Moor and Coast Sub-Area which covers a finger of coastal grazing marsh below 10 m AOD known as Steart Flats. The openness of the grazing marsh results in the area being '*visually dominated by the bulk of Hinkley Point power station to the west; it is separated from the sea by a significant sea wall, which provides vehicular access to Hinkley Point*'[16]. Land to the north of the power stations lies within a third sub-area: The Coast (St Audries to Hinkley Point) Sub-Area.

14.5.22. Beyond the host and immediately adjacent LCAs, there are a number of other LCAs as defined by the West Somerset Landscape Character Assessment and Sedgemoor Landscape Assessment and Countryside Design Guide. A summary of the descriptions provided in the extant documents for all LCAs within the Study Area is provided in **Table 14-7.**

Table 14-7 - LCAs within the Study Area: key characteristics

LCA	Key characteristics/character description
West Somerset LCAs	
Quantock Vale LCA: Eastern Lowlands Sub-Area	▪ *'Predominant topography is low rolling hills to about 70 m AOD, although at the foot of the Quantocks, between Stringston and Dodington, the gentle slopes rise to the Quantock Hills.* ▪ *The landform and soils are suitable for agriculture.* ▪ *Medium sized deciduous woodlands and copses are scattered throughout the area.* ▪ *The frequent lanes, which are straighter than elsewhere in the district, are hedged with mixed species hedges and hedgerow trees as are the fields.* ▪ *Long settled area, the only village of any size is Stogursey and all other settlements are small, nucleated villages, hamlets and farms.* ▪ *Hinkley Point power station is a notable modem development in the area'*[16]*.*
Quantock Vale LCA: The Coast (St Audries to Hinkley Point) Sub-Area	▪ *'Erodible cliffed coastline, the cliffs are fronted by a wave cut, intertidal rock platform, both are of considerable interest for their geological and geomorphological features .* ▪ *The cliffs are internationally important for their geology and are used as a geological standard for the Jurassic, Blue Lias.* ▪ *This cliffed coastline differs from the Blue Anchor to St Audrie's section in that there is virtually no settlement or tourist development on the coast'*[16]*.*
Quantock Vale LCA: Wick Moor and Coast Sub-Area	▪ *'Land lies below 10 m AOD and covered with recent alluvial deposits.* ▪ *The area is quite open and bleak, used as grazing marsh in the summer with an absence of field boundaries although some scrubby vegetation has developed along the line of drainage ditches.* ▪ *The marsh is subject to flooding and is of high nature conservation value; it is designated SAC, Ramsar Site, SPA and SSSI, as are the fronting beach and sub tidal areas.* ▪ *There is a submarine forest off the coast at Wick Moor, which is an important site for marine archaeology.* ▪ *The area is visually dominated by the bulk of Hinkley Point power station to the west; it is separated from the sea by a significant sea wall, which provides vehicular access to Hinkley Point'*[16]*.*
Quantock Vale LCA: Wall Common and Coast Sub-Area	▪ *'Land lies below 10 m AOD and covered with recent alluvial deposits, sands and gravels.*

LCA	Key characteristics/character description
	▪ *Humic alluvial gleyed soils cover these deposits and it is drained by a complex if rectilinear drainage ditches that divide the common into pasture fields.* ▪ *The area is quite open and bleak, it is used as grazing marsh in the summer and some scrubby vegetation has developed along the line of drainage ditches.* ▪ *The fields are at risk of flooding but are separated from the sea by a series of low cobble embankments.* ▪ *To the seaward side there is a strip of salt marsh the fronting beach and sub tidal areas.* ▪ *This coast is of high nature conservation value; it is designated SAC, Ramsar Site, SPA and SSSI, and forms part of Stert Flats National Nature Reserve.* ▪ *Two farms are located in the area on rising land toward the Stolford ridge which separates this lowland from Wick Moor to the west'*[16].
Sedgemoor LCAs	
Lowland Hills – Stockland Hills	▪ *'The area is characterised by its series of small hills, rising from 10 m to an average of 50 to 60 m AOD.* ▪ *The area contains a patchwork of larger, mainly arable and small pasture fields, unmanaged hedgerows and small woodlands. Field patterns are likely to be largely medieval in origin* ▪ *The LCA features a dispersed settlement pattern which includes scatter of isolated hamlets and farmsteads and small settlements such as Stockland Bristol which are linear in form and of medium density. Streets run along contours.* ▪ *Much of the area has an undeveloped backwater character but features such as electricity pylons linking to the nearby Hinkley Point power stations and the silos of a grain depot bring signs of the modern world into this landscape'*[17].
Levels and Moors – Estuarine Levels	▪ *'Most of the area is a coastal belt of clay several miles wide at generally about 6 m AOD.* ▪ *This is a largely flat landscape, with a pattern of fields defined by a combination of drainage channels and hedges. The field pattern is irregular and it is notable that many of the major local drainage channels or rhynes take a sinuous course.* ▪ *The area is mostly used for pasture for dairy cattle, with some arable cropping, especially for animal feeds.* ▪ *The areas close to the coast, near the confluence of the Parrett with the Bristol Channel, are generally quite open and windswept, and*

LCA	Key characteristics/character description
	many of the fields contain small ponds, which were sunk to water the livestock. These areas were also drained or reclaimed in later periods and this is another factor in the lack of hedgerows. ▪ *The coastal levels adjacent to the Parrett estuary are largely devoid of buildings'*[17]*.*
Levels and Moors – Sea Edge/Intertidal Zone	▪ *'The western edge of the Levels meets the Bristol Channel in a broad open landscape of sand dunes, mud flats and river estuaries.* ▪ *On the western side of the mouth of the River Parrett, Sedgemoor's coastal edge includes the relatively remote settlement of Steart and bird hides associated with the Bridgwater Bay National Nature Reserve.* ▪ *The pattern of the rivers and the flats has changed many times throughout history, leaving remnant archaeological features in the Parrett estuary, with sea walls and embankments now protecting the area.* ▪ *The estuarine flats are an important, designated area for nature conservation'*[17]*.*

Seascape character

14.5.24. The *Seascape Character Assessment for the South West Inshore and Offshore marine plan*[19] *areas* identifies the coastline and waters to the north of the Site as Marine Character Area (MCA) 40: Bridgwater Bay. This MCA encompasses the combined arc-shaped bay of Bridgwater and Blue Anchor and is characterised by expansive sand, mud and gravel sediments exposed at low tide. HPA and HPB are described as:

> *'A dominant landmark in an open, largely featureless shoreline; the contrasting uplands of the Quantock Hills and Exmoor rising behind.'*[19]

14.5.25. It is similarly recognised as one of the key characteristics of this MCA and it:

> *' … forms a large, box-shaped feature looming on the immediate coastal skyline – strongly recognisable in views from offshore'.*[19]

14.5.26. Other pertinent key characteristics of this MCA are as follows:

- *'Wide, open expanse of drying Holocene mud and sandflats forming the combined large-scale bays of Bridgwater and Blue Anchor. The tidal rivers of the Parret and Axe drain into Bridgwater Bay.*
- *Shallow, frequently changing water depths owing to the high tidal range of the wider Bristol Channel – up to 10m at springs. Depths reach a maximum of 23 m at the transition to the Channel.*
- *A generally featureless shoreline, but of significant geological and biological interest. Wave-cut platforms create a significant rock reef system supporting a range of marine invertebrates.*

- *Expansive mudflats and salt meadows within the wider Severn Estuary SAC, SPA and Ramsar site, supporting diverse populations of overwintering, passage and migrant waders and waterfowl.*
- *Suction dredgers use Dunball Wharf to land aggregates extracted from the Bristol Channel (MCA 49). At Combwich a specialist Ro-Ro terminal is used by barges servicing Hinkley Point power station.*
- *The England Coast Path traverses the coastal edge from Highbridge to Minehead.*
- *The Quantock Hills AONB rises up behind Bridgwater Bay, linking westwards to Exmoor National Park to form an upland backcloth. The MCA forms part of the seascape setting to both protected landscapes.*
- *Expansive views across the wider Severn Estuary and Bristol Channel (MCAs 39 and 41), with strong intervisibility with the South Wales coast including the Glamorgan cliffs and Brecon Beacon foothills.'*[19]

Landscape designations

National landscape designations

14.5.27. The Quantock Hills National Landscape is sited approximately 5.2 km to the west/south-west of HPB at its closest point and therefore outside of the Study Area as shown in **Figure 14.18**. The Quantock Hills Area of Outstanding Natural Beauty Management Plan 2019-2024[18] includes the views from the hilltop area within the National Landscape as being one of the special qualities of the Quantock Hills and identifies that the new development at HPC to the west of HPB impacts on the views from the National Landscape. This is as a consequence of the scale of the HPC construction activities and the reduced separation distance between HPC and the Quantock Hills National Landscape, with a minimum separation distance of approximately 3.9 km compared to approximately 5.2 km to the Site boundary and 5.9 km to the reactor building within HPB.

Local landscape designations

14.5.28. There are no local landscape designations within the Study Area.

Visual baseline – existing visibility

ZTV

14.5.29. As indicated by the ZTV in **Figure 14.2**, visibility of the tallest component of HPB (the existing reactor building at a height of 66.5 m AGL) is concentrated across the lower-lying coastal fringes, primarily to the east of the Site, extending across Steart Flats and across Bridgwater Bay. To the west of the Site, visibility becomes partially fragmented along the coast whilst future views from this direction would be further interrupted by the emerging built form within HPC.

14.5.30. Areas where visibility of HPB begins to become more limited are concentrated at distances of ~2.5 km to the south and south-east of HPB. This fragmentation reflects the localised screening provided by the rolling topography and, in some cases, the small woodlands. Visibility will also be reduced by built form and localised tree cover and vegetation all of which provide a screening role. High roadside hedgerows are prevalent across the local landscape and are effective in screening views towards the existing structures within HPB from the narrow lanes which cross the landscape.

Field survey findings

14.5.31. The field survey allowed the following broad conclusions to be made with regard to the existing visibility of infrastructure within the HPB Site boundary, which is influenced by a combination of vegetative screening, topography, elevation, distance and direction from the Site:

- *The role of vegetative screening within the Site boundary*: in many of the views from the closest publicly accessible locations to the Site (e.g. from local PRoWs, including the diverted King Charles III England Coast Path, and from Wick Moor open access land), the reactor building within HPB is partially to heavily filtered during the winter months by the deciduous woodland belt which extends along the southern and eastern perimeter of the operational land uses within the Site, as evidenced in the baseline photography from Viewpoints 1 and 2. This screening would be more effective during the summer months when there would be only occasional close-distance views of the reactor building within HPB. The woodland belt is also of sufficient height and density to screen views of the lower height ancillary buildings within the Site boundary from locations where other influences on the availability of views across the Site play a more minor role. The field survey verified the important screening role of the woodland belt in preventing the reactor building from becoming a dominant or overbearing visual component in close-distance views.
- *The role of topography within the Study Area*: in middle-distance views from inland areas to the south, south-east and south-west of the Site, local variations in topography play a role in influencing the visibility of infrastructure within the HPB Site boundary. Local ridgelines and horizons formed by intervening areas of slightly elevated land, screen views of the woodland belt around the southern and eastern perimeter of the Site. All of the lower height ancillary buildings within the Site boundary are also screened by the intervening topography in these views, leaving the upper façade of the reactor building visible as a moderately prominent visual component on the skyline above the interning landform. This influence on visibility is most evident at Viewpoints 3 and 7.
- *The role of elevation within the Study Area*: the clearest views of infrastructure within the Site boundary are from the low-lying areas of grazing marsh and coastal locations to the east of the Site as evidenced at Viewpoint 4 and partially at Viewpoint 9, which are both located at elevations which are comparable to or slightly lower than those within the Site (less than 10 m AOD). From coastal locations to the east, infrastructure to the north of the reactor building is evident in baseline views including the gas turbine houses and associated stack which are greater in height than the neighbouring warehouses.
- A slight increase in elevation compared to the Site, as evidenced at Viewpoint 5 at an elevation of 25 m AOD, allows a slightly greater proportion of infrastructure within the Site to be visible above the perimeter woodland belt. The most elevated views are available from the hills within the western fringes of the Study Area. However, as shown in the baseline view from Viewpoint 10 (at an elevation of 105 m AOD), the increasing separation distance means that whilst a greater proportion of infrastructure within the Site boundary is visible, the Site forms a small proportion of the elevated, panoramic views which are available and individual buildings (with the exception of the reactor building) are not readily distinguishable.
- *The role of distance and direction*: 10 of the 11 viewpoints from which a photographic record has been obtained are from locations within 5 km of the Site boundary. The photography in **Figures 14.4** to **14.14** illustrates the role of increasing separation distance from the reactor building as follows:

- the reactor building within the Site boundary can form a prominent visual component at distances of up to 1.5 km (Viewpoints 1 to 4) although deviations do occur within this geographic range where foreground elements provide screening (as evidenced at Viewpoints 1 and 2);
- at distances of between 1.5 km and 4 km, the reactor building often becomes a co-prominent visual component alongside foreground and mid-ground elements as a consequence of its mass and height (Viewpoints 5, 6 and 7); and
- at distances in excess of 4 km, the reactor building forms an identifiable but more minor component of the often wide, panoramic baseline views which are available from coastal or elevated locations (Viewpoints 8, 9 and 10).

14.5.32. A review of the baseline photography also indicates that there are very few locations within the Study Area in which the infrastructure within HPB is viewed in isolation from other large-scale infrastructure. The proximity to the reactors within HPA and the construction site of HPC means that this existing and emerging infrastructure is nearly always visible in the same field of view as HPB. In addition, HPB is often viewed beyond the steel lattice pylons which cross the landscape to the south of the Site and which form locally prominent vertical elements in receptors' views. It is also important to note that this is not a static landscape and baseline views will continue to gradually alter notably as built form and infrastructure within the HPC development site are completed and become operational and the HPA infrastructure is decommissioned and removed.

Future baseline

Overview

14.5.33. Landscape change is an ongoing and inevitable process and would continue across the Study Area irrespective of whether the Proposed Works proceed. Change can arise through natural processes (e.g. the maturity of woodlands) and natural systems (e.g. river erosion) or, as is often the case, occurs due to human activity, land use, management or neglect.

Hinkley Point C

14.5.34. The landscape within the Study Area of HPB is undergoing considerable and continual change as a consequence of the construction and subsequent operation of HPC. The LVIA for HPC (as reported in the Environmental Statement Non-Technical Summary) identified that the construction phase would lead to a locally significant loss of landscape features and a temporary and significant change in the local landscape and seascape character. The visual assessment also concluded that the views of residents of Shurton, Burton, Knighton, Wick and local properties and users of elevated areas of landscape such as the north-eastern summits of the Quantock Hills AONB would be significantly affected during the HPC construction period. The magnitude of visual change would decrease at distances in excess of 5 km.

14.5.35. The future operation of HPC would lead to a decrease in the landscape and visual impacts when compared to the construction phase (as reported in the LVIA[23]) as a consequence of the removal of construction plant, equipment and temporary buildings. The landscape impacts are described as being predominantly minor due to the landscape restoration proposals which would introduce several new and valuable landscape features within the HPC site. Localised major visual changes would continue to be experienced by the closest residential visual receptors and for users of the PRoW along the adjacent coastline (which has subsequently become part of the King Charles III

England Coast Path since the publication of the HPC ES) due to the proximity of the large-scale infrastructure associated with the operational power station. Long-term (15 years onwards) moderate visual effects would also remain within a local area in the north-eastern part of the Quantock Hills National Landscape due to its elevation.

14.5.36. Reference to paragraph 6.17.2 of the HPC Environmental Statement Non-Technical Summary indicates that the diverted section of King Charles III England Coast Path would be reinstated on completion of the construction of seawall'. It is currently unknown as to whether the PRoWs which currently form the diversion would revert back to their former local status or continue as an inland alternative of the national trail as marked on 1:25,000 OS mapping. However, the sensitivity of visual receptors using the routes, either as a route of local or national importance would be similar (High), and therefore their future status would not alter the conclusions of the LVIA.

Hinkley Point C Connection

14.5.37. Reference to the Works Plans for the Hinkley Point C Connection Project[26] indicates that short sections of 400kV overhead lines which cross the landscape to the south of HPB would be removed, whilst new sections would be introduced to connect the existing 400kV line with a new substation within HPC. The towers would be steel lattice pylons and whilst there would be some reconfiguration of tower locations, the presence of overhead lines through this landscape would remain a constant.

Hinkley Point A

14.5.38. HPA, to the immediate west of HPB, ceased generation in 2000. HPA is undergoing the decommissioning process, which includes the gradual removal of structures from within the HPA site, with the exception of the two reactor buildings. The HPA decommissioning will be considered as part of the cumulative assessment within the LVIA.

Other forces for change

14.5.39. Beyond the landscape and visual changes associated with the construction and operation of HPC and the decommissioning of HPA, the published profile reports for NCAs 142: Somerset Levels and Moors[14] and 146: Vale of Taunton and Quantock Fringes[15] reports on a number of drivers of change which may also alter the existing baseline landscape and visual within the LVIA Study Area as follows:

- Climate change could lead to:
  - sea level rise, combined with increased storminess, storm-surges and intense rainfall events has the potential to increase the risk of coastal flooding, and accelerate natural erosion of the coastline beyond the stretch in front of Hinkley Point, where coastal defences have been put in place;
  - increased storminess combined with increased summer drought may lead to the loss of mature and/or veteran trees such as hedgerow oak and black poplar and parkland trees;
  - the extent of semi-natural habitats, already fragmented, may deteriorate further due to pressures from changes in climate including a reduction in species diversity as a result of warmer winters and more frequent drought conditions;

[26] National Grid (2014). *Document 4.1.9 Works Plans Section H – Hinkley Point Line Entries. Hinkley Point C Connection Project*. (online). Available at: https://www.nationalgrid.com/electricity-transmission/document/143356/download (Accessed August 2024)

- a longer growing season with higher temperatures may encourage the expansion of arable and horticultural production. An increased pressure for food production as a result of a motivation for greater national food self-sufficiency may also be a driver towards more arable production; and
- an increasing trend in UK-based holidays may see more coastal development pressures for tourist related infrastructure such as caravan parks along the coastal fringe which could change the windswept and open character of the coastline.

14.5.40. Chalara dieback of ash became established in the UK in 2012, placing the future of common ash (*Fraxinus excelsior*) as a woodland, hedgerow and urban tree species under threat. Reference to the Forestry Commission's map of confirmed infection sites for the UK[27] indicates that the two OS 10 km grid squares which cover the LVIA Study Area has a record of confirmed infection of ash trees within a natural environment. Impacts on the landscape are likely to develop relatively slowly, starting with the decline of young trees and only becoming readily apparent if mature trees are felled. This may open up views for visual receptors and alter the structure of existing woodlands.

Cumulative baseline

14.5.41. The potential changes associated with Ash dieback and climate change are unpredictable and insufficient detail is understood for them to be considered as part of a future baseline, in this LVIA. As a consequence, and for the purposes of the LVIA, the assessment will be undertaken against the current landscape and visual baseline with the developments at HPA and HPC considered as part of the cumulative scenario. The assumed timescales and broad overlaps between the HPB, HPC and HPA Proposed Works are illustrated in **Table 14-8**.

[27] Defra project team including Fera, Natural Resources Wales and Forestry Commission. 2024. Chalara (Hymenoscyphus fraxineus) - infections confirmed in the Wider Environment as at 26/01/2024. (online). Available at: https://chalaramap.fera.co.uk (Accessed August 2024)

Table 14-8 - HPB, HPC and HPA Proposed Works: assumed timescales and overlaps

Station	Years									
	2021-30	2031-40	2041-50	2051-60	2061-70	2071-80	2081-90	2091-00	2101-10	2111-20
HPB										
HPC								(assumed)	(assumed)	
HPA										

	Construction phase
	Operational phase
	Preparations for Quiescence phase / Pre-Care & Maintenance phase (HPA)
	Quiescence phase / Care & Maintenance phase (HPA)
	Final Site Clearance phase

14.6 Embedded environmental measures

14.6.1. As part of the design process, consideration has been given to the development of an Interim State Landscape Plan. However, due to the effective screening which already surrounds the site on all sides (by way of woodland belts to the east, south and west and floodwall to the north), it was concluded that little benefit would accrue from the implementation of an Interim State Landscape Plan prior to the start of the Quiescence phase to reduce the impact of decommissioning works. This conclusion has been reinforced by the high proportion of hard standing across the Works Area and minimal opportunities to introduce new planting.

14.6.2. Measures relating to retained woodland screening and colour of the cladding of the Safestore are considered as part of the Assumptions and Limitations in **Section 14.8**.

14.7 Assessment methodology

14.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this chapter, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the LVIA in this Environmental Statement (ES).

General approach

14.7.2. The assessment methodology is set out in **Appendix 14A**. The methodology for the LVIA and CLVIA has been undertaken in accordance with best practice guidance which is listed in **Table 14-3**.

14.7.3. With regard to the specific assessment methodology which applies to this chapter, paragraph 7.11 of GLVIA3[9] states that projects included for cumulative assessment should include '*other examples of the same type of development*'[9]. The guidance goes on to state, at paragraph 7.16, that '*Stakeholders ... will be concerned about the totality of the cumulative effect of past present and future proposals. Those assessing these effects should reflect these concerns …*' [9]. Similar types of development within the Study Area that have a characterising effect on landscape receptors and are visible in views are therefore considered as a cumulative (existing) development, in the CLVIA.

Determination of significance

14.7.4. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[28] (hereafter referred to as 'EIADR') recognises that decommissioning will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identify those environmental resources that warrant investigation as those that are '*likely to be significantly affected by the Proposed Scheme'*.

14.7.5. The EIADR does not define significance. The significance of an effect resulting from a development is determined in this assessment by reference to:

- the sensitivity (or 'importance') of a landscape or visual receptor. This considers the susceptibility of the receptor to change and the value of the receptor in accordance with paragraphs 5.39-5.47 GLVIA3[9] for landscape sensitivity and paragraphs 6.31-6.37 of *GLVIA3*[9] in relation to visual sensitivity. A full description of these considerations is provided in the methodology in **Appendix 14A**; and
- the magnitude of the landscape or visual change. This is assessed by considering its size and scale, geographical extent and duration/reversibility of the proposed change in accordance with paragraphs 5.48-52 of GLVIA3[9] in relation to landscape effects and paragraphs 6.38-6.41 of GLVIA3[9] concerning visual effects. A full description of these considerations is provided in the methodology in **Appendix 14A**.

14.7.6. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk potential effects presented by the Proposed Works.

14.7.7. In accordance with the EIADR[28], it is important to determine whether the effects, assessed as a result of the Proposed Works, are likely to be significant. Significant landscape and visual effects will be highlighted in bold in the text and in most cases, relate to all those effects that result in a 'Major or a 'Major / Moderate' effect as indicated in **Table** 14-9 (and shaded dark grey). 'Moderate' levels of effect (shaded light grey) can also be assessed as significant[29], subject to the assessor's

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[28] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed March 2024).

[29] It should be noted that under the methodology utilised for the HPC LVIA, Moderate effects were always assessed as being Significant. As a consequence, all Moderate effects reported in this LVIA and its accompanying appendices when referring to HPC, have also been concluded as being Significant.

professional opinion, which should be clearly explained as part of the assessment. White or un-shaded boxes in **Table 14-9** indicate a non-significant effect.

14.7.8. In those instances where there would be no effect, the magnitude has been recorded as 'Zero' and the level of effect as 'None'. Intermediate levels of magnitude and levels of effect are also used in the LVIA, for example High – Medium magnitude or Major to Major/Moderate level of effect.

Table 14-9 - Significance evaluation matrix applicable to the LVIA

		Landscape or Visual Sensitivity		
		High	**Medium**	**Low**
Magnitude of landscape or visual change	**High**	**Major (Significant)**	**Major/Moderate (Significant)**	Moderate (Potentially Significant)
	Medium	**Major/Moderate (Significant)**	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)
	Low	Moderate (Potentially Significant)	Moderate/Minor (Not Significant)	Minor (Not Significant)
	Very Low	Moderate/Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
	Zero	None		

14.7.9. The type of effect is also considered and may be direct or indirect; temporary or permanent (reversible); cumulative; and positive, neutral or negative. The assessment unavoidably involves a combination of both quantitative and subjective assessment and wherever possible a consensus of professional opinion has been sought through consultation, internal peer review, and the adoption of a systematic, impartial, and professional approach.

14.8 Assumptions and limitations

14.8.1. The scope of the LVIA is based upon the following assumptions:

- As an assumption of EIADR (as outlined in **Chapter 2: The Decommissioning Process**), it is anticipated that the Safestore would be coloured a light grey which is comparable to the existing façade of the reactor building. This would reduce contrast with a backdrop which is predominantly sky, as evidenced in the Viewpoint Photography presented in **Figures 14.4** to **14.14**. This will form part of the 'EIA Baseline' for decommissioning at the Site. As such, should the Safestore cladding not come forward with a light grey colour, it will be subject to the process outlined in **Appendix 5C: EIADR Compliance.**
- A further assumption of the EIADR is that there are no proposed works to the woodland belts which sit outside of the Works Area but inside of the Site. It is assumed that this woodland would be retained to allow for its continued screening, and this will also form part of the 'EIA Baseline' for decommissioning at the Site. Any changes to this assumption would trigger the process outlined in **Appendix 5C: EIADR Compliance.**
- The visual assessment assumes winter conditions i.e. no leaf cover on deciduous trees and shrubs and therefore a worst-case scenario in accordance with *GLVIA3*[9] and *Technical Guidance Note 06/19 Visual Representation of Development Proposals*[10]; and

- Whilst the landscape and visual effects as a consequence of the Final Site Clearance phase have been assessed for the development, the cumulative effects during the Final Site Clearance phase have not been assessed since this phase would occur in approximately 80 years' time. It is not possible to predict potential cumulative development or changes to existing / proposed developments across this time period.

14.9 Scope of the assessment

Study area

14.9.1. The LVIA has been based upon a Study Area which extends spatially to include a 3 km offset from the Works Area, as described in detail in paragraphs 14.3.2 and 14.3.3.

Temporal scope

14.9.2. The temporal scope of the LVIA is consistent with the period over which the Proposed Works would be carried out and therefore covers the decommissioning phases, as follows:

- Preparations for Quiescence phase: main focus of activity with deplanting, waste processing and conversion of the reactor building into a Safestore with some activities happening concurrently;
- Quiescence phase: period of relative inactivity for ~70 years. During this period the Safestore structure would remain in place but there is minimal other activity on site; and
- Final Site Clearance phase: re-activity on site with removal of the reactors and plant housed in the Safestore, retrieval of waste from debris vaults and subsequent transfer onwards from site and final site re-instatement to end state occurring at the same time.

Potential receptors

14.9.3. Landscape and visual receptors that could be significantly affected by the Proposed Works are identified based on their sensitivity/importance/value and the spatial and temporal scope of the assessment.

14.9.4. The assessment of whether an effect has the potential to be of likely significance has been based upon a review of the existing evidence base, consideration of commitments made (embedded environmental measures), professional judgement and where relevant, recommended aspect-specific methodologies and established practice. In applying this judgement, use has been made of a simple test that to be significant, an effect must be of sufficient importance that it should be considered when making a decision to grant consent.

14.9.5. The identification of geographically specific landscape and visual receptors that could be subject to potentially significant effects has been guided by review of the ZTV for the Proposed Works as shown on **Figure 14.2**, supported by a review of the data sources set out in **Section 14.3**.

14.9.6. The ZTV determines the type and distribution of visual receptors who may potentially be able to see one or more of the components of the Proposed Works and would therefore experience visual impacts. Further refinement of visual receptors (residential, recreational and vehicular receptors) for inclusion in the LVIA has been carried out as part of the assessment process through an analysis of the conclusions of a Viewpoint Assessment undertaken at each of the agreed viewpoints included in **Table 14-5.** A summary table of the findings of the Viewpoint Assessment is provided **Appendix 14B** (**Table 14B-11**) in order of distance from the Proposed Works. This summary table allows analysis of the results to be included as part of the LVIA process and defines the direction,

elevation, distance and nature of the potential visual effects thereby identifying the areas where potential significant effects may occur.

14.9.7. Effects upon landscape receptors are not entirely dependent on the presence of a visual effects pathway, i.e. the landscape receptor being located within the preliminary ZTV. Landscape effects can also be generated by changes to other perceptual characteristics impacting upon landscape qualities such as tranquillity. Hence the scope of the landscape assessment has been determined by reviewing the defined key characteristics of the LCAs in the LVIA Study Area and a consideration of the potential for these characteristics or the special landscape qualities of landscape designations to be impacted by the Proposed Works.

14.9.8. Landscape and visual receptors that have the potential for significant effects are summarised in **Table 14-10.**

Table 14-10 - Receptors subject to potential effects

Receptor Group	Receptors included within the Group
Landscape and Seascape Character	Quantock Vale - Eastern Lowlands Sub-Area Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area Quantock Vale - Wick Moor and Coast Sub-Area Quantock Vale - Wall Common and Coast Sub-Area
Visual Receptors: Settlements	Stolford Wick Stogursey
Visual Receptors: Recreational Routes	King Charles III England Coast Path West Somerset Coast Path Castles & Coast Way Local PRoW networks
Visual Receptors: Recreational Destinations	Open Access Land: Man Moor, North Moor, Wick Moor, Great Hooks and Little Hooks, Ham, Sharpham, North Ham and Goose Marsh and Redham
Visual Receptors: Transport Routes	Wick Moor Drove

Likely significant effects

14.9.9. The likely significant landscape and visual effects that will be taken forward for assessment in the ES are summarised in **Table 14-11**.

Table 14-11 - Likely significant landscape and visual effects

Phase	Receptors	Likely significant effects
Preparations for Quiescence phase	Host LCAs: Quantock Vale - Eastern Lowlands Sub-Area, Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area and Quantock Vale - Wick Moor and Coast Sub-Area Adjacent LCAs: Wall Common and Coast Sub-Area given its proximity to the Proposed Works. Viewpoint assessment at the 10 agreed viewpoint locations (see **Table** 14-6). Detailed visual assessment for receptors listed in **Table 14-10**.	Potential significant changes to the character and key characteristics of defined landscape/seascape areas and receptors' views as a consequence of increased on-site activity associated with demolition work (including marine infrastructure) and construction of the Safestore including the use of cranes.
Quiescence phase	Host LCAs: Quantock Vale - Eastern Lowlands Sub-Area, Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area and Quantock Vale - Wick Moor and Coast Sub-Area. Adjacent LCAs: Wall Common and Coast Sub-Area given its proximity to the Proposed Works. Viewpoint assessment at the 10 agreed viewpoint locations (see **Table** 14-6). Detailed visual assessment for receptors listed in **Table 14-10**.	Potential changes to the character and key characteristics of defined landscape/seascape areas and receptors' views as a consequence of the presence of the Safestore and absence of low-level ancillary buildings
Final Site Clearance phase	Host LCAs: Quantock Vale - Eastern Lowlands Sub-Area, Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area and Quantock Vale - Wick Moor and Coast Sub-Area Adjacent LCAs: Wall Common and Coast Sub-Area given its proximity to the Proposed Works. Viewpoint assessment at the 10 agreed viewpoint locations (see **Table** 14-6).	Potential changes to the character and key characteristics of defined landscape/seascape areas and receptors' views as a consequence of increased on-site activity associated the removal of the Safestore and final site clearance.

Phase	Receptors	Likely significant effects
	Detailed visual assessment for receptors listed in **Table 14-10**.	

14.9.10. The effects scoped out from further assessment in the LVIA are:

- Landscape effects – landscape elements within the Works Area: The decommissioning process would involve the gradual reduction and removal of buildings, and infrastructure from within the Site. These landscape elements are of low landscape sensitivity (under the methodology outlined in **Appendix 14A**) and as a consequence, their removal would not give rise to significant effects. The landscape elements of higher sensitivity including the woodland screening belts, trees, scrub and grassland would be retained and therefore the magnitude of landscape change upon these elements would be minimal. As such landscape elements will not require further assessment and are scoped out of the LVIA.
- Landscape effects – NCAs: Whilst reference to the NCAs provide landscape context, they are too extensive and generalised to potentially experience significant landscape effects. This approach is advocated by paragraph 5.14 of *GLVIA*[9] and the smaller local authority LCAs are to be taken forward as receptors in the LVIA. NCAs 142 and 146 will therefore not require further assessment and are scoped out of the LVIA.
- Landscape/seascape effects – MCAs: MCAs are similar to NCAs whereby they cover large areas of coastline and offshore areas and provide a seascape context. However, they are too extensive and generalised to potentially experience significant seascape effects from the Proposed Works. The emerging presence of HPC means that large-scale infrastructure will continue to have a presence along this section of the coastline and the gradual reduction in scale and eventual removal of the built form of HPB within existing views is unlikely to significantly alter the character and key characteristics of MCA 40. The offshore decommissioning activities, which may involve the use of plant and equipment, would be too small in scale and short-lived to significantly alter the key characteristics of this MCA. The smaller local authority LCAs which cover the coastline are to be taken forward as receptors in the LVIA. MCA 40 will therefore not require further assessment and is scoped out of the LVIA.
- Landscape effects – Sedgemoor LCAs: The following LCAs will not require further assessment:
  - Lowland Hills – Stockland Hills: The closest northern-most fringes of this LCA around Stockland Bristol lie within the preliminary ZTV, with a larger proportion of the LCA falling outside of the ZTV coverage. The Proposed Works would not generate a magnitude of landscape change that is sufficient to significantly alter the character, or key characteristics of this LCA. This conclusion is based on field survey observations regarding the baseline role of local landforms and consequent limited views of ancillary built form and activities at HPB from within this LCA, and the scale of the proposed activities at a minimum separation distance of 2.5 km.
  - Levels and Moors – Estuarine Levels: A large proportion of this low-lying LCA coincides with the preliminary ZTV at a minimum separation distance of 3.5 km. Field survey observations recorded a minimal baseline role of ancillary built form and low-level activities at HPB from within this LCA as a consequence of the perimeter woodland. This, together with a baseline in which the reactor buildings at HPB (and HPA) are established components in the landscape and the scale of the activities proposed at HPB has led to the conclusion that the Proposed

Works would not generate a magnitude of landscape change that is sufficient to significantly alter the character, or key characteristics of this LCA.

- Levels and Moors – Sea Edge/Intertidal Zone: A large proportion of this coastal LCA lies within the preliminary ZTV. A baseline in which the reactor buildings at HPB (and HPA) are established features in the landscape and the scale of the activities proposed at HPB at distances in excess of 2.5 km, has led to the conclusion that the Proposed Works would not generate a magnitude of landscape change that is sufficient to significantly alter the character, or key characteristics of this LCA.

- Landscape effects – landscape designations: The Proposed Works would not generate a magnitude of landscape change that is sufficient to significantly affect the defined Special Qualities of the Quantock Hills National Landscape such as natural beauty, tranquillity and panoramic views or opportunities for quiet recreation. This conclusion is based upon the following:
  - a review of the Quantock Hills National Landscape's Statement of Significance as set out in Appendix 2 of the Quantock Hills AONB Management Plan[18];
  - the photographs and visualisations from locations within the National Landscape prepared for the 2011 LVIA[23] for HPC, in particular Viewpoints 22, 23, 27 and 28 from the closest edge of the National Landscape and subsequent assessment of effects for HPC[23] which concluded Very Low, occasionally increasing to Low, magnitudes of visual change. There is a reduced separation distance between HPC and the Quantock Hills National Landscape, with a minimum separation distance of approximately 3.9 km compared to approximately 5.2 km to the Site boundary and 5.9 km to the reactor building within HPB;
  - the fragmented pattern of ZTV coverage within the National Landscape which would be further reduced by the pattern of hedgerows within the National Landscape, is not accounted for within the ZTV;
  - a baseline in which HPA and HPB are established components in outwards views from this nationally designated landscape and the future role of the closer HPC; and
  - the scale of the activities proposed at HPB at a minimum separation distance of 5.2 km.
- Landscape effects – landscape designations: Exmoor National Park is a nationally designated landscape which lies a minimum of 15.8 km to the south-west of the HPB reactor. The very distant presence of decommissioning activities which are centred around existing infrastructure would not significantly affect the Special Qualities of the Exmoor National Park, its integrity or its landscape character. The assessment contained in the Hinkley Point C LVIA for three viewpoints located within the Exmoor National Park, at North Hill (viewpoint reference S2), Conygar Tower (viewpoint reference S4) and at Rodhuish Common (viewpoint reference S5), concluded a Very Low magnitude of visual change, which combined with a High receptor sensitivity, resulted in a Minor visual effect due to the '*very long distance*' in which '*all construction activities, machinery (including tower cranes) and HPC buildings would be barely perceptible*'. The Proposed Works would therefore not generate a magnitude of landscape change that is sufficient to significantly affect the defined Special Qualities of the Exmoor National Park.
- Visual effects – visual receptors located outside of the ZTV: effects cannot be experienced by visual receptors with no potential views of any component of the Proposed Works i.e. those visual receptors located outside the ZTV. Whilst the settlements of Knighton, Burton and Shurton lie within the ZTV, a review of the visualisations prepared for viewpoints in and around these

settlements as part of the HPC Environmental Statement (specifically Viewpoints 8, 9, 10 and 11[23]) has been undertaken. This indicates that under future visual baseline conditions, the gradual reduction in scale and eventual removal of the built form of HPB would not be visible due to the gradual maturation of planting proposed as part of the restoration and advanced planting associated with HPC. This planting is now well established and provides effective screening.

14.10 Assessment of landscape effects

14.10.1. The assessment of landscape effects considers the effects on the character and key characteristics of the host Quantock Vale LCA Sub Areas (Eastern Lowlands, the Coast (St Audries to Hinkley Point) and Wick Moor and Coast) as well as the indirect effect upon neighbouring Quantock Vale LCA Sub Area; Wall Common and Coast, given its low-lying nature, extensive overlap with the ZTV (**Figure 14.2**) and proximity to the Proposed Works.

Quantock Vale LCA - Eastern Lowlands Sub-Area

Landscape sensitivity

14.10.2. An assessment of the sensitivity of LCA Quantock Vale - Eastern Lowlands Sub-Area, derived through consideration of the value of the landscape and its susceptibility to the type of development proposed in accordance with the methodology presented in **Appendix 14A,** is set out in **Table 14-12.**

Table 14-12 - Assessment of landscape sensitivity: Quantock Vale - Eastern Lowlands Sub-Area

Criteria	Commentary	Value / Susceptibility
Landscape value		
Landscape designation	Although adjoining the Quantock Hills National Landscape, this LCA Sub-Area is not covered by a local or national landscape designation.	Medium
Natural heritage	There are no internationally or nationally designated nature conservation assets within the LCA Sub-Area. Locally important sites are recognised as Local Wildlife Sites at Hinkley, Mud House Copse, Wick Part Covert, Monk Wood, Cole Pool Field, Martin's Wood and Honibere Wood.	Medium
Cultural heritage	Fairfield, to the west of Stogursey is a grade II Registered Park and Garden whilst a number of Scheduled Monuments are also present within the LCA Sub-Area including Stogursey Castle and the round cairn known as Pixie's Mound close to the Site. A cluster of listed buildings are present within Shurton and Stogursey with others associated with isolated dwellings and farmsteads. The central and southern part of Stogursey is designated as a conservation area.	Medium
Condition	The published Assessment records that '*historically and culturally it is still possible to read the medieval pattern of the landscape'* thereby indicating a landscape with a strong structure (intact historic field patterns) although the this is countered by the pylons and	Medium

Criteria	Commentary	Value / Susceptibility
	power stations which represent large-scale incongruous features which have an influence across this landscape.	
Associations	There are no known associations with well-known literature, poetry, art, TV/film or music that contribute to perceptions of the landscape beyond any local associations that are undocumented.	Low
Distinctiveness	Beyond the power stations, this is a largely agricultural landscape with limited presence of distinctive, rare or unusual features that help to confer a strong sense of place or identity.	Medium
Recreational	The inland section of the King Charles III England Coast Path passes through this LCA Sub-Area as does the recently formed Castles & Coast Way walking trail. Elsewhere, a moderate proportion of local PRoWs provide recreational access through the landscape.	High
Perceptual (Scenic)	This is a rural landscape of ordinary aesthetic appeal, featuring large-scale electricity generating and transmission infrastructure which can be visually prominent or dominant from within the landscape.	Medium to Low
Perceptual (wildness and tranquillity)	The presence of large scale overt human influence is a recognised detractor from tranquillity[30] and levels of wildness are likely to be limited.	Low
Overall value	The overall value is assessed as Medium	Medium
Landscape susceptibility		
Strength and robustness	Whilst the '*medieval pattern of the landscape'* may exhibit some vulnerability, generally, this is a landscape that is recognised, through the approval and emergence of HPC, as being able to accommodate change.	Medium to Low
Landscape Scale	This is a landscape of a suitably large enough scale to accommodate the type of change proposed.	Low
Openness / Enclosure	Levels of openness and enclosure vary throughout the LCA Sub-Area as evidenced in the baseline photography from Viewpoints 4, 5, 6 and 10 and are strongly influenced by variations in local landform and vegetation patterns.	High to Low
Reinstatement	This is an agricultural landscape comprising a large proportion of landcover and elements which are generally capable of rapid reinstatement.	Low

[30] Campaign to Protect Rural England (2005). Mapping Tranquility. Defining and assessing a valuable asset. https://www.oldsite.cpre.org.uk/resources/countryside/tranquil-places/item/1856

Criteria	Commentary	Value / Susceptibility
Skyline	Many of the views from within the LCA Sub-Area feature a developed skyline in which the two existing and emerging nuclear power stations are large-scale features alongside the overhead transmission lines, all of which can be locally prominent/dominant visual components.	Low
Association	There is a direct association between the Proposed Works and other similar contemporary developments within the landscape associated with the generation and distribution of electricity.	Low
Perceptual Qualities	The existing infrastructure disrupts scenic qualities and levels of remoteness and tranquillity.	Low
Landscape Context	This LCA Sub-Area is distinct from the neighbouring small area of marsh, the coast and the rolling farmland which have led to the Quantock Vale LCA being divided into four sub-areas. However, the open nature of some areas within the landscape means that features within adjoining areas inevitably exert a characterising role.	Medium
Overall susceptibility	The overall susceptibility to the type of change proposed is judged to be Low	Low
The overall value of this LCA Sub Area is Medium. The overall susceptibility is judged to be Low indicating a Medium overall sensitivity.		

Magnitude of landscape change and level of effect

Preparations for Quiescence phase

Proposed Works only

14.10.3. This phase of the Proposed Works focusses on the demolition and dismantling of buildings from within the Works Area, the conversion of the reactor building into a Safestore and other supporting infrastructure. Although these are separate components of the Proposed Works, they would occur in tandem, and their potential effect on the key characteristics and character of the host Quantock Vale - Eastern Lowlands Sub-Area are assessed together.

14.10.4. All existing buildings, with the exception of the reactor building, would gradually be deconstructed to ground level. Whilst the activities associated with this could aurally and visually disrupt landscape character and qualities, the baseline scenic qualities and levels of tranquillity and remoteness are already diluted by the presence and construction of large-scale infrastructure. Furthermore, all ground and low-level activities within the Works Area, including the introduction of the Decommissioning Waste Processing Facility (DWPF), would have limited characterising influence as a consequence of the retained perimeter tree belt, which minimises intervisibility from within the surrounding landscape. The works associated with the Cooling Water (CW) System decommissioning including the presence of plant and equipment, would introduce offshore activity which would have a small characterising role across a three-year period from the areas of landscape closest to the coastline. From within a moderate proportion of the LCA Sub-Area (as demonstrated by the ZTV in **Figure 14.2**), the Works Area would maintain an industrial presence through the retention of the reactor building (which would be repurposed as the Safestore), whilst the deployment of cranes and other elevated activities would be viewed alongside or beyond existing large-scale vertical landscape components. Consequently, any visible works would be incremental to rather than new, characterising influences.

14.10.5. Whilst the Works Area would undergo high levels of landscape change, this would be restricted to within the Works Area only where landscape value, landscape susceptibility and consequently landscape sensitivity are all judged to be low. Elsewhere within the LCA Sub-Area, the magnitude of landscape change would be Low, reducing to Very Low towards the end of the phase when on-site activity and the deployment of cranes ceases.

14.10.6. During the Preparations for Quiescence there would be a **Moderate** and **Not Significant** level of effect within the Works Area and a **Moderate/Minor** and **Not Significant** adverse effect within the wider LCA Sub Area, due to increased site activity, levels of disturbance and periodic deployment and presence of cranes. This would reduce to a **Minor** and **Not Significant** level of effect at the end of the Preparations for Quiescence phase which would be neutral.

14.10.7. The duration of these effects would be medium-term but leading to long-term effects for those components of the Proposed Works that would be retained through the Quiescence phase.

Cumulative effects

14.10.8. With regard to the decommissioning of HPA, the two reactor buildings play a comparable landscape role to that within HPB, with ground and low-level structures having a limited characterising role upon the host LCA Sub-Area due to the presence of the perimeter tree cover. Consequently, the landscape effects of the end of HPA's Pre-Care and Maintenance phase[31], which would overlap with HPB's Preparations for Quiescence phase, are anticipated to be similar. The level of landscape effect would therefore be **Moderate** and **Not Significant** within the HPA Works Area and **Moderate/Minor** and **Not Significant** within the wider LCA Sub Area. HPA is likely to enter into its Care and Maintenance[32] phase during HPB's Preparations for Quiescence phase, when effects on the landscape would reduce to **Minor**, neutral and **Not Significant**.

[31] The equivalent phase to the Proposed Works Preparations for Quiescence Phase
[32] The equivalent phase to the Proposed Works Quiescence Phase

14.10.9. In relation to the construction of HPC, the LVIA[23] concluded that a **Major** to **Moderate** effect on the landscape character of the Eastern Lowlands Sub-Area which coincides with the HPB Study Area. A **Major** (Year 1) to **Moderate** (Year 15) and adverse **Significant** effect would occur within the coastal area around Lilstock to the west during the operational phases, with **Minor** adverse effects which are **Not Significant** occurring within the remainder of the Quantock Vale - Eastern Lowlands Sub-Area at both Year 1 and Year 15.

Quiescence phase

Proposed Works only

14.10.10. During the Quiescence phase, the Works Area would gain a more 'settled' appearance when compared to the same area during the baseline and preceding Preparations for Quiescence phase.

14.10.11. The upper façades of the Safestore would be visible above the perimeter trees belts which would contain and screen the lower parts of the building. The Safestore building itself is assumed to retain the same footprint, colour pallet and massing of the previous reactor building and would not therefore present as a new feature in the landscape whilst the reduction in built form across the Works Area would not be widely perceived from within the surrounding landscape with the exception of the coastal fringes close to Stolford. Consequently, and when assessed against the baseline, the magnitude of landscape change would be Very Low to Zero (within areas of landscape that fall outside of the ZTV) and the level of effect within the LCA Sub-Area would be **Minor** to **None**, neutral and **Not Significant.** The duration of these effects would be long term.

Cumulative effects

14.10.12. The Care and Maintenance phase of HPA would run concurrently (at least partially) with that of HPB and would have comparable landscape effects. As such, the level of effect would be **Minor** to None, neutral and **Not Significant**.

14.10.13. At the point at which HPA enters its Final Site Clearance phase towards the end of HPB's Quiescence phase, the operation of cranes and the gradual dismantling of the HPA's two Safestores would again increase activity within the HPA site with all elevated activity perceived from within the surrounding landscape. Given that this activity would be comparable to that of the Pre-Care and Maintenance phase, the level of adverse landscape effect would be **Moderate** and **Not Significant** within the HPA Works Area (High magnitude of change within an area of Low sensitivity) and **Moderate/Minor** and **Not Significant** within the wider LCA Sub Area as a consequence of a Low magnitude of change within a Medium sensitivity landscape.

14.10.14. Upon cessation of all activity, the absence of the large-scale built form would give rise to a **Low** magnitude of change within the wider landscape, with some dilution in the dominance of large-scale infrastructure but with HPB, HPC and the overhead line and towers continuing to play a landscape role. At this point, the landscape effects associated with HPA would be **Moderate** within the HPA Works Area and **Moderate/Minor** from within the LCA Sub Area, beneficial and **Not Significant**.

14.10.15. The operational HPC would continue to have a **Moderate** and adverse **Significan**t effect from within the coastal area around Lilstock to the west and a **Minor** and **Not Significant** adverse effect from within the remainder of the Quantock Vale - Eastern Lowlands Sub-Area.

14.10.16. Increased site activity, including the periodic deployment of cranes and elevated demolition activities, would recommence during the Final Site Clearance phase. Waste created from deplanting and dismantling of structures within the Safestore would be processed in a newly constructed Decomissioning Waste Management Centre (DWMC) before being removed from site, although this facility would have limited characterising influence due to the screening provided by perimeter woodland. The level of activity and corresponding audible and visual disturbance during the removal of the Safestore and any remaining built elements, would be comparable to that generated during the Preparations for Quiescence phase and would give rise to a high magnitude of change within the Works Area where landscape sensitivity is low. The continued influence of large-scale infrastructure within HPC to the west of the site and the separation distance between areas the Proposed Works and areas of LCA Sub-Area to the south and east means that the elevated activities associated with the Proposed Works would contribute to a low magnitude of landscape change. Consequently, short-term landscape effects during the dismantling and deconstruction would be **Moderate/Minor**, **Not Significant** and adverse due to increased site activity. With increased separation distance and screening from intervening landform, buildings or vegetation, the magnitude of change would decrease to Very Low to Zero.

14.10.17. Following cessation of the deconstruction works, the absence of the large scale built form, which contributes to "*Hinkley Point and the power lines*"[16] being cited as one of the key characteristics of this LCA Sub Area under baseline conditions, would be a noticeable change to the landscape to the east and south of the Site and to a lesser degree to the west, where HPC would continue to have a large-scale landscape role. This would result in a Medium magnitude of change within approximately 1.5 km of the Works Area and a **Moderate**, beneficial and permanent landscape effect within the local landscape. The Moderate effect is assessed as being **Not Significant** due to the continued role of HPC which would maintain the key characteristic, although diluted by the absence of HPA and HPB. Beyond 1.5 km, the landscape effects associated with the removal of the large-scale reactor building would again reduce with increasing geographical distance and screening from intervening landform, buildings or vegetation such that the magnitude of change would range from Low though to Very Low. Effects within these areas of landscape would be **Moderate/Minor** to **Minor** and **Not Significant** and landscape effects would be beneficial and permanent. Within areas of the LCA Sub-Area outside of the ZTV, the magnitude of change would be Zero and effects would be None.

14.10.18. Considering either the Works Area or the wider LCA Quantock Vale - Eastern Lowlands Sub-Area, this would amount to a **Not Significant** effect on the landscape character. The nature of these effects would also be temporary and adverse during the Final Site Clearance phase and permanent, direct and beneficial thereafter.

Quantock Vale LCA - The Coast (St Audries to Hinkley Point) Sub-Area

Landscape sensitivity

14.10.19. An assessment of the sensitivity of LCA Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area, derived through consideration of the value of the landscape and its susceptibility to the type of development proposed in accordance with the methodology presented in **Appendix 14A,** is set out in **Table 14-13.**

Table 14-13 - Assessment of landscape sensitivity: Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area

Criteria	Commentary	Value / Susceptibility
Landscape value		
Landscape designation	Within the Study Area this LCA Sub-Area is not covered by a local or national landscape designation.	Medium
Natural heritage	The coastline is rich in nature conservation interests including both national (Somerset Wetlands National Nature Reserve, Bridgwater Bay SSSI and Blue Anchor to Lilstock Coast SSSI) and international (Severn Estuary Ramsar Site, Severn Estuary Special Area of Conservation (SAC) and Severn Estuary Special Protection Area (SPA)) designations. It also features the Blue Anchor to Lilstock Cliff Local Wildlife Site. The extant assessment also notes that the cliffed coastline, fronted by a wave cut, inter-tidal rock platform are of "*considerable interest for their geological and geomorphological features*"[16]. It continues "*the cliffs, are internationally important for their geology*" whilst "*the inter-tidal platforms are some of the best in Britain*" [16].	High
Cultural heritage	Any archaeological, historical or cultural interest which may be present (there are no designated sites) provide limited contribution to the landscape.	Low
Landscape condition	This is an area of coastline with distinctive features and displaying natural processes through coastal erosion which is countered by the power stations which represent large-scale incongruous features which have an influence across the coastal fringe.	Medium
Associations	The area of coastline to the north of Shurton is known as Shurton Bars which is referenced in Samuel Taylor Coleridge's poem 'Lines written at Shurton Bars in 1795.	Medium
Distinctiveness	This is a landscape with rare and distinctive features which contribute a strong sense of identity.	High
Recreational	The West Somerset Coast Path and King Charles III England Coast Path and associated Coastal Margin follow the coastline through the LCA Sub-Area with the King Charles III England Coast Path being of national importance as a recreational route. The beaches along the coastline are also publicly accessible.	High
Perceptual (Scenic)	Views to the west along the coastline or north are of higher scenic quality that those directed east where the large-scale infrastructure plays a prominent visual role, increasing to dominate from the section of LCA Sub Area to the north of the Works Area.	High to Low

Criteria	Commentary	Value / Susceptibility
Perceptual (wildness and tranquillity)	The absence of settlement and tourist attractions from along this section of coastline and the proximity to the natural coastal processes contribute to perceptions of wildness and tranquillity. This is tempered within some sections of the LCA Sub-Area by the proximity to the large infrastructure of HPA, HPB and the emerging HPC Nuclear Power Stations which are overt man-made structures and a recognised detractor[33] from tranquillity.	High to Low
Overall value	The overall value is assessed as High within sections of LCA Sub area to the west of the Site and judged to be Medium to the north of the Site where perceptual qualities are lower.	High to Medium
Landscape susceptibility		
Strength and robustness	This is a robust landscape that is able to withstand continual change through natural processes without undue adverse effects.	Low
Landscape Scale	This is a landscape of a suitably large enough scale to accommodate the type of change proposed.	Low
Openness / Enclosure	This is an open landscape with limited screening and may therefore be of higher susceptibility to the Proposed Works.	High
Reinstatement	This LCA Sub-Area features higher value, characteristic landcover and elements (the cliff and inter-tidal platform) that cannot be easily reinstated or replaced.	High
Skyline	Many of the views east along the coastline from within the LCA Sub-Area feature a developed skyline in which the two existing and emerging nuclear power stations are large scale features which can be prominent increasing to dominant visual components on the skyline. However, views west and north feature a largely undeveloped skyline.	High to Low
Association	There is a direct association between the Proposed Works and other similar contemporary developments along the coastline.	Low
Perceptual Qualities	The aural and visual influence of the sea experienced from this landscape is a recognised contributor to tranquillity and the natural processes of the coastline can evoke a sense of wildness and naturalness. However, this is tempered by the proximity to the large-scale infrastructure which is a recognised detractor from tranquillity.	High to Low

[33] Campaign to Protect Rural England (2005). Mapping Tranquility. Defining and assessing a valuable asset. https://www.oldsite.cpre.org.uk/resources/countryside/tranquil-places/item/1856

Criteria	Commentary	Value / Susceptibility
Landscape Context	This LCA Sub-Area is distinct from the neighbouring two small areas of marsh and the inland farmland which have led to the Quantock Vale LCA being divided into four sub-areas. However, the open nature of this Sub-Area means that features within adjoining areas inevitably exert a characterising role.	Low
Overall susceptibility	The overall susceptibility to the type of change proposed is judged to be Medium.	Medium
Overall sensitivity to the Proposed Works		
The overall value of this LCA Sub Area is High to Medium. The overall susceptibility is judged to be Medium indicating a High overall sensitivity for the section of LCA Sub Area to the west of HPC and a Medium overall sensitivity from the area of LCA Sub Area to the north of HPC, HPA and HPB.		

Magnitude of landscape change and level of effect

Preparations for Quiescence phase

Proposed Works only

14.10.20. The majority of low-level activities across the Works Area including the introduction of the DWPF, would have limited characterising influence as a consequence of the boundary wall which separates the Works Area from the LCA Sub Area and which limits intervisibility, or by the intervening HPA and emerging HPC from areas to the west. Elevated demolition activities associated with the larger gas turbine houses and associated stack towards the northern edge of the Works Area would represent a visual disruption to landscape character although the baseline scenic qualities and levels of tranquillity and remoteness are already diluted by the presence of large-scale infrastructure particularly from the section of LCA Sub Area adjacent to the Hinkley Complex.

14.10.21. The works associated with the decommissioning of the CW System including the presence of plant and equipment, would introduce offshore activity within views northwards across Bridgwater Bay. Works within the outfall channel and at the Sea Wall would have a direct effect on a small proportion of this LCA Sub Area during a three-year period including the introduction of safety barriers. This would take place along or close to a section of coastline which already features engineered structures (sea wall, concrete outfall channel and caisson structure) and as a consequence, further modifications would not generate notable contrast. There would be no changes to the cliffs or further physical disruption to the wave cut platforms, both of which form key characteristics of this landscape.

14.10.22. From within a large proportion of the LCA Sub-Area, the Works Area would maintain an industrial presence through the retention of the reactor building (which would be repurposed as the Safestore), whilst the deployment of cranes and other elevated activities would be viewed alongside or beyond existing large-scale vertical landscape components.

14.10.23. Works associated with the CW System decommissioning allied with elevated activity occurring in close proximity, would give rise to a Medium magnitude of landscape change across a small proportion of this LCA Sub Area whose character is already influenced by engineered structures along the coastline or where perceptual qualities are diluted by the adjacent presence of large-scale infrastructure. The characterising influence of the Proposed Works from sections of the Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area to the west of HPC, would be reduced as a consequence of separation distance and the intervening presence of HPA and the emerging HPC such that the magnitude of landscape change would be Low/Very Low.

14.10.24. During the Preparations for Quiescence there would be a **Moderate** and **Not Significant** adverse effect within the section of Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area which lies adjacent to the Hinkley Complex and where landscape sensitivity is judged to be Medium. This Moderate effect is judged to be **Not Significant** due to the landscapes' key characteristics being maintained. This would reduce to a **Minor** and **Not Significant** level of effect at the end of the Preparations for Quiescence phase when crane activity ceases and only the Safestore remains, which would be neutral.

14.10.25. From within the wider LCA Sub Area to the west, which is assessed as being of High sensitivity, a **Moderate/Minor** and **Not Significant** adverse effect is concluded for the Preparations for Quiescence phase. The duration of these effects would be medium-term but leading to long-term effects for those components of the Proposed Works that would be retained through the Quiescence phase.

Cumulative effects

14.10.26. With regard to the decommissioning of HPA, the two reactor buildings play a comparable landscape role to that within HPB, with ground and low-level structures having a limited role upon the Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area due to the presence of a wall along the northern edge of HPA which reduces intervisibility from the closest areas of landscape. Consequently, the landscape effects of HPA's Pre-Care and Maintenance phase, which would overlap with HPB's Preparations for Quiescence phase, are anticipated to be similar due to the presence of elevated activities occurring in close proximity but within a baseline in which large-scale infrastructure already has a characterising role. The level of landscape effect would therefore be **Moderate** and **Not Significant** within the section of LCA Sub Area north of the Hinkley Complex and **Moderate/Minor** and **Not Significant** within the wider LCA Sub Area. HPA is likely to enter into its Care and Maintenance phase during HPB's Preparations for Quiescence phase when effects on the landscape would become **Moderate/Minor** or **Minor**, neutral and **Not Significant**.

14.10.27. In terms of the construction phase of HPC, the LVIA[23] concluded that a **Major** and **Significant** effect would occur within the Quantock Vale - The Coast (St Audries to Hinkley Point) reducing to a **Moderate** and adverse **Significant** effect at both Year 1 and Year 15 of the operational phase.

Quiescence phase

Proposed Works only

14.10.28. The cessation of all low-level construction and elevated crane activity would return the Site to one which is comparable with the baseline in which the Safestore, housing the reactor building, would remain visible above surrounding vegetation or the flood wall from locations within the LCA Sub Area immediately to the north of the Works Area. The Safestore building itself is assumed to retain the same footprint, colour pallet and massing of the previous reactor building and would not therefore present as a new feature in the landscape. With the exception of the removal of the larger gas turbine houses and associated stack towards the northern edge of the Works Area, the reduction in built form would not be widely perceived from within the surrounding landscape and there would be no long term offshore presence of the CW system. Consequently, and when assessed against the baseline, the magnitude of change would be Very Low to Zero (within the small and fragmented areas of landscape that fall outside of the ZTV) and the level of effect within the LCA Sub-Area would be **Moderate/Minor** to **None**, neutral and **Not Significant**. The duration of these effects would be long term.

Cumulative effects

14.10.29. The Quiescence phase of HPA would run concurrently (at least partially) with that of HPB and would have comparable landscape effects. As such, the level of effect would be **Minor** to None, neutral and **Not Significan**t.

14.10.30. At the point at which HPA enters its Final Site Clearance phase within HPB's Quiescence phase, the operation of cranes and the gradual dismantling of the HPA's two Safestores would again increase activity within the HPA site with all elevated activity perceived from within this coastal LCA Sub Area. The level of landscape effect would therefore be **Moderate** and **Not Significant** within the section of LCA Sub Area north of the Hinkley Complex (where the landscape sensitivity is assessed as being Medium and the magnitude of change is assessed as Medium) and **Moderate/Minor** and **Not Significant** within the wider LCA Sub Area to the west which is judged to be of higher sensitivity with a Low/Very Low magnitude predicted. Upon completion of HPA's Final Site Clearance phase, the absence of the large-scale built form would give rise to a Medium/Low magnitude of change with the neighbouring HPB and HPC continuing to play a landscape role. At this point, the landscape effects associated with HPA would be Moderate/Minor from within the LCA Sub Area and **Not Significant**.

14.10.31. The operational HPC would continue to have a **Moderate** and adverse **Significant** effect.

Final Site Clearance phase

Proposed Works only

14.10.32. Increased site activity, including the periodic deployment of cranes and elevated demolition activities, would recommence during the Final Site Clearance phase. Waste created from deplanting and dismantling of structures within the Safestore would be processed in a newly constructed DWMC before being removed from site, although this facility would have limited characterising influence due to the presence of the boundary wall along the northern boundary of the Works Area which limits intervisibility. The level of activity and corresponding audible and visual disturbance during the removal of the Safestore and any remaining built elements, would be comparable to that generated during the Preparations for Quiescence phase and would give rise to a Medium magnitude of change to the north of the Works Area where landscape sensitivity is judged to be Medium. The continued

influence of large-scale infrastructure within HPC to the west of the site means that the elevated activities associated with the Proposed Works would contribute to a Very Low magnitude of landscape change from the section of LCA Sub Area to the west of HPC. Consequently, short-term landscape effects during the dismantling and deconstruction would be **Moderate** to **Moderate/Minor**, **Not Significant** and adverse due to increased site activity.

14.10.33. Following cessation of the deconstruction works, the absence of the large scale built form, would be a noticeable change to the landscape to the north of the Site and to a lesser degree to the west, where HPC would continue to have a large-scale landscape role. This would result in a Medium magnitude of change from the section of LCA Sub Area to the immediate north of the Site and a **Moderate**, beneficial and permanent landscape effect within the local landscape. The Moderate effect is assessed as being **Not Significant** due to the continued role of HPC. Beyond HPC to the west, the landscape effects associated with the removal of the large-scale reactor building would reduce such that the magnitude of change would typically be Very Low as infrastructure within HPC continues to play a large-scale role. Effects within these areas of landscape (which are assessed as being of High sensitivity) would be **Moderate/Minor** and **Not Significant** and landscape effects would be beneficial and permanent. Within the small and fragmented area of the LCA Sub-Area outside of the ZTV, the magnitude of change would be Zero and effects would be None.

Quantock Vale LCA - Wick Moor and Coast Sub-Area

Landscape sensitivity

14.10.34. An assessment of the sensitivity of LCA Quantock Vale - Wick Moor and Coast Sub-Area, derived through consideration of the value of the landscape and its susceptibility to the type of development proposed, in accordance with the methodology presented in **Appendix 14A,** is set out in **Table 14-14.**

Table 14-14 - Assessment of landscape sensitivity: Quantock Vale - Wick Moor and Coast Sub-Area

Criteria	Commentary	Value / Susceptibility
Landscape value		
Landscape designation	This LCA Sub-Area is not covered by a local or national landscape designation.	Medium
Natural heritage	This LCA Sub-Area encompasses the nationally designated Bridgwater Bay SSSI and internationally designated Severn Estuary Ramsar Site and Special Protection Area.	High
Cultural heritage	There are no cultural heritage designations within this LCA Sub-Area.	Low
Condition	This intact and well-defined area coastal marsh is used as grazing marsh during the summer months. Some areas of scrubby vegetation have developed along the drainage ditches which are prevalent across this area.	Medium

Criteria	Commentary	Value / Susceptibility
Associations	There are no known associations with well-known literature, poetry, art, TV/film or music that contribute to perceptions of the landscape beyond any local associations that are undocumented.	Low
Distinctiveness	This is a low-lying area of coastal marsh with limited presence of distinctive, rare or unusual features that help to confer a strong sense of place or identity.	Medium
Recreational	The West Somerset Coast Path and King Charles III England Coast Path and associated Coastal Margin follow the coastline through the LCA Sub-Area. A large proportion of the area features open access land whilst a number of local PRoWs also pass through the Wick Moor and Coast Sub-Area.	High
Perceptual (Scenic)	This is an area which is largely devoid of landscape features with the exception of large-scale infrastructure in the form of National Grid's transmission lines and towers which cross the LCA Sub-Area and neighbouring power stations. Reference to the Works Plans for the Hinkley Point C Connection Project[34] indicates that whilst tower locations would be reconfigured within this LCA Sub Area, with some sections of overhead line removed and new sections introduced, the presence of overhead lines through this landscape would remain a constant. The extant Assessment describes this area as being "*quite open and bleak*"[16] and "*visually dominated by the bulk of Hinkley Point power station to the west"*[16].	Low
Perceptual (wildness and tranquillity)	Levels of wildness and tranquillity are diluted by its proximity to large scale infrastructure.	Low
Overall value	The overall value of the landscape is assessed as Medium.	Medium
Landscape susceptibility		
Strength and robustness	This is a robust landscape that is able to withstand continual change through natural processes without undue adverse effects.	Low
Landscape Scale	This is a landscape of a suitably large enough scale to accommodate the type of change proposed.	Low
Openness / Enclosure	This is an open landscape with limited screening and may therefore be of higher susceptibility to the Proposed Works.	High
Reinstatement	This is coastal marshland comprises a large proportion of landcover and elements which are generally capable of rapid reinstatement.	Low

[34] National Grid (2014). *Document 4.1.9 Works Plans Section H – Hinkley Point Line Entries. Hinkley Point C Connection Project*. (online). Available at: https://www.nationalgrid.com/electricity-transmission/document/143356/download (Accessed August 2024)

Criteria	Commentary	Value / Susceptibility
Skyline	Many of the views from within the LCA Sub-Area feature a developed skyline in which HPB is a large-scale feature which can visually dominate the area. The pylons are also locally prominent vertical infrastructure.	Low
Association	There is a direct association between the Proposed Works and other similar contemporary developments traversing and adjoining the LCA Sub-Area which are associated with the generation and distribution of electricity.	Low
Perceptual Qualities	The existing infrastructure disrupts scenic qualities and levels of remoteness and tranquillity.	Low
Landscape Context	This LCA Sub-Area is distinct from the neighbouring small area of marsh, the coast and the rolling farmland which have led to the Quantock Vale LCA being divided into four sub-areas. However, the open nature of the landscape means that features within adjoining areas inevitably exert a characterising role.	Medium
Overall susceptibility	The overall susceptibility to the type of change proposed is judged to be Low	Low
Overall sensitivity to the Proposed Works		
The overall value of this LCA Sub Area is Medium. The overall susceptibility is judged to be Low indicating a Medium overall sensitivity.		

Magnitude of landscape change and level of effect

Preparations for Quiescence phase

Proposed Works only

14.10.35. Intervisibility with the Proposed Works varies from across this LCA Sub Area as evidenced in the views from Viewpoints 1 (**Figure 14.4**), 2 (**Figure 14.5**), 3 (**Figure 14.6**) and 4 (**Figure 14.7**) which lie within or on the boundary of the Quantock Vale - Wick Moor and Coast Sub-Area. All existing buildings, with the exception of the reactor building, would gradually be deconstructed to ground level and the activities associated with this could aurally and visually disrupt landscape character and qualities.

14.10.36. All ground and low-level activities within the Works Area, including the introduction of the DWPF and works within the existing Sewage Works which coincides with this LCA Sub Area, would have limited characterising influence as a consequence of the perimeter tree belt, which would be retained or through the intervening presence of local landform (as demonstrated at Viewpoint 3) both of which minimise intervisibility from within the surrounding landscape. The exception to this is from coastal locations towards the eastern fringes of the Sub Area, from which offshore works associated with the decommissioning of the CW System (including the presence of plant and equipment) and demolition of the Gas Turbine Houses and associated Stack would be perceived. These works, together with the deployment of mobile cranes and other elevated activities would indirectly affect a landscape in which the baseline scenic qualities and levels of tranquillity and remoteness are already diluted by the

presence of large-scale infrastructure associated with the power stations and overhead line and associated towers. Consequently, any visible works and vertical elements would be incremental to rather than new, characterising influences.

14.10.37. From within a large proportion of the LCA Sub-Area, the Works Area would maintain an industrial presence through the retention of the reactor building (which would be repurposed as the Safestore). The magnitude of change is assessed as being Low within this landscape which is already "*visually dominated by the bulk of Hinkley Power Station*"[16] and adverse effects would be **Moderate/Minor** and **Not Significant**. This would reduce to a **Minor** and **Not Significant** level of effect at the end of the Preparations for Quiescence phase when on-site activity and the deployment of cranes ceases and effects would typically become neutral. Some beneficial effects may occur within coastal areas from which the removal of built form and offshore structures and a corresponding simplification of patterns within the adjoining landscape would be perceived.

14.10.38. The duration of these effects would be medium-term but leading to long-term effects for those components of the Proposed Works that would be retained through the Quiescence phase.

Cumulative effects

14.10.39. With regard to the decommissioning of HPA, the two reactor buildings play a comparable landscape role to that within HPB, with ground and low-level structures having a limited characterising role upon this LCA Sub-Area due to the presence of the perimeter tree cover. Consequently, the landscape effects of HPA's Preparations for Quiescence phase, which would overlap with HPB's Preparations for Quiescence phase, are anticipated to be similar. The level of landscape effect would therefore be **Moderate/Minor** and **Not Significant** from within the Quantock Vale - Wick Moor and Coast Sub-Area. HPA is likely to enter into its Quiescence phase during HPB's Preparations for Quiescence phase when effects on the landscape would reduce to **Minor**, neutral and **Not Significant**.

14.10.40. In relation to the operational HPC, the LVIA[23] reclassifies the part of the Wick Moor and Coast Sub-Area which extends to the west of Wick Moor Drove as Eastern Lowlands, and more specifically as Rolling Farmland East – Stogursey within a site scale character assessment. The level of effect during the construction phase was assessed as being **Major** and **Significant** reducing to **Minor** and **Not Significant** at both Year 1 and Year 15 of the operational phase as a consequence of the landscape mitigation measures which extend across this area of landscape including new woodland, grassland and hedgerow. Landscape effects on the remainder of the Wick Moor and Coast Sub-Area to the east of Wick Moor Drove were also judged to be **Major** and **Significant** during the construction phase and **Minor** and **Not Significant** at Year 1 and Year 15 as a consequence of the operation of HPC.

Quiescence phase

Proposed Works only

14.10.41. The upper façades of the Safestore would be visible to varying degrees above or through the perimeter trees belts which would contain and screen the lower parts of the building. The Safestore building itself is assumed to retain the same footprint, colour pallet and massing of the previous reactor building and would not therefore present as a new feature from within the surrounding landscape whilst the reduction in built form across the Works Area would be partially perceived from the northern coastal fringes of this Sub Area only. Consequently, and when assessed against the baseline, the magnitude of change would be Very Low and the level of effect within the LCA Sub-Area would be **Minor** and **Not Significant**. Landscape effects would typically be neutral but beneficial

where a reduction in built form and offshore structures are evident. The duration of these effects would be long term.

Cumulative effects

14.10.42. The Quiescence phase of HPA would run concurrently (at least partially) with that of HPB and would have comparable landscape effects. As such, the level of effect would be **Minor**, neutral and **Not Significant** from within the Wick Moor and Coast Sub-Area.

14.10.43. At the point at which HPA enters its Final Site Clearance phase within HPB's Quiescence phase, the operation of cranes and the gradual dismantling of the HPA's two Safestores would again increase activity within the HPA site with all elevated activity perceived to varying degrees above the perimeter trees cover. The level of landscape effect would therefore increase to **Moderate/Minor** and **Not Significant**. Upon completion of HPA's Final Site Clearance phase, the absence of the large-scale built form would give rise to a Low magnitude of change with some reduction and dilution in the dominance of large-scale infrastructure but with HPB, HPC and the overhead line and towers continuing to play a landscape role. At this point, the landscape effects associated with HPA would be **Moderate/Minor** from within the LCA Sub Area and **Not Significant**.

14.10.44. The operational HPC would continue to have a **Minor** and adverse **Not Significant** effect.

Final Site Clearance phase

Proposed Works only

14.10.45. Increased site activity, including the periodic deployment of cranes and elevated demolition activities, would recommence during the Final Site Clearance phase. Waste created from deplanting and dismantling of structures within the Safestore would be processed in a newly constructed DWMC before being removed from site, although this facility would have limited characterising influence due to the screening provided by perimeter woodland. The level of activity and corresponding audible and visual disturbance during the removal of the Safestore and any remaining built elements, would be comparable to that generated during the Preparations for Quiescence phase with the presence of vertical components being perceived from within a landscape where vertical electricity transmission towers have been a long-established feature. As a consequence, the elevated activities associated with the Proposed Works would be contribute to a low magnitude of landscape change and short-term landscape effects during the dismantling and deconstruction would be **Moderate/Minor**, **Not Significant** and adverse due to increased site activity.

14.10.46. Following cessation of the deconstruction works, the absence of the large scale built form, which contributes to the description of the landscape being "*visually dominated by the bulk of Hinkley Power Station*"[16], would be a noticeable change alongside the removal of HPA. This would result in a Medium magnitude of change from across this LCA Sub Area and a **Moderate**, beneficial and permanent landscape effect. The Moderate effect is assessed as being **Not Significant** due to the continued role of HPC and the overhead line and towers, which although having a more minor landscape role, would nevertheless maintain a large-scale infrastructure presence.

Quantock Vale LCA - Wall Common and Coast Sub-Area

Landscape sensitivity

14.10.47. An assessment of the sensitivity of LCA Quantock Vale - Wall Common and Coast Sub-Area, derived through consideration of the value of the landscape and its susceptibility to the type of development proposed in accordance with the methodology presented in **Appendix 14A,** is set out in **Table 14-15.**

Table 14-15 - Assessment of landscape sensitivity: Quantock Vale - Wall Common and Coast Sub-Area

Criteria	Commentary	Value / susceptibility
Landscape value		
Landscape designation	This LCA Sub-Area is not covered by a local or national landscape designation.	Medium
Natural heritage	A small part of the coastal fringes of this LCA Sub-Area is designated as the Somerset Wetlands National Nature Reserve. A slightly greater proportion, including Catsford Common and Wall Common are nationally recognised as the Bridgwater Bay SSSI and internationally recognised as the Severn Estuary Ramsar Site, Special Area of Conservation and Special Protection Area.	High
Cultural heritage	There are no cultural heritage designations within this LCA Sub-Area.	Low
Landscape condition	This intact and well-defined area coastal marsh is used as grazing marsh during the summer months. Some areas of scrubby vegetation have developed along the drainage ditches which are prevalent across this area.	Medium
Associations	There are no known associations with well-known literature, poetry, art, TV/film or music that contribute to perceptions of the landscape beyond any local associations that are undocumented.	Low
Distinctiveness	This is a low-lying area of coastal marsh with limited presence of distinctive, rare or unusual features that help to confer a strong sense of place or identity.	Medium
Recreational	The West Somerset Coast Path and King Charles III England Coast Path and associated Coastal Margin follow the coastline through the LCA Sub-Area. A number of local PRoWs also pass through the landscape between the coast and Stockland Bristol.	High
Perceptual (Scenic)	The LCA Sub Area is described as being "*quite open and bleak*"[16].	Low

Criteria	Commentary	Value / susceptibility
Perceptual (wildness and tranquillity)	The increasing separation distance from the Hinkley Complex and structures associated with electricity transmission is likely to increase perceptions of tranquillity, wildness and remoteness.	Medium
Overall value	The overall value of the landscape is assessed as Medium.	Medium
Landscape susceptibility		
Strength and robustness	This is a robust landscape that is able to withstand continual change through natural processes without undue adverse effects.	Low
Landscape Scale	This is a landscape of a suitably large enough scale to accommodate the type of change proposed.	Low
Openness / Enclosure	This is an open landscape with limited screening and may therefore be of higher susceptibility to the Proposed Works.	High
Reinstatement	This is coastal marshland comprises a large proportion of landcover and elements which are generally capable of rapid reinstatement.	Low
Skyline	HPB, HPA and electricity transmission towers are small scale features which contribute to a partially developed skyline but do not dominate due to increasing separation distance.	Medium
Association	There is a direct association between the Proposed Works and other similar contemporary developments which are associated with the generation and distribution of electricity.	Low
Perceptual Qualities	The separation distance from existing large-scale infrastructure means that levels of remoteness and tranquillity are higher whilst scenic qualities are diluted by the generally featureless landscape.	Medium
Landscape Context	This LCA Sub-Area is distinct from the neighbouring small area of marsh, the coast and the rolling farmland which have led to the Quantock Vale LCA being divided into four sub-areas. However, the open nature of the landscape means that features within adjoining areas inevitably exert a characterising role.	Medium
Overall susceptibility	The overall susceptibility to the type of change proposed is judged to be Medium.	Medium
Overall sensitivity to the Proposed Works		
The overall value of this LCA Sub Area is Medium. The overall susceptibility is judged to be Medium indicating a Medium overall sensitivity.		

Magnitude of landscape change and level of effect

Preparations for Quiescence phase

Proposed Works only

14.10.48. All ground and low-level activities within the Works Area, including the introduction of the DWPF, would have minimal characterising influence across this LCA Sub Area as a consequence of the retained perimeter tree belt together with increasing separation distance and the corresponding smaller scale of low-level activities which would make them more susceptible to screening by intervening elements such as hedgerows and built form within Stolford. Similar to the Wick Moor and Coast LCA Sub Area, the exception to this is from coastal locations from the northern fringes of the LCA Sub Area, from where offshore works associated with the decommissioning of the CW System (including the presence of plant and equipment) and the demolition of the Gas Turbine Houses and associated Stack would be perceived. These works, together with the deployment of mobile cranes and other elevated activities would indirectly affect a landscape in which the baseline scenic qualities are already partially diluted by the presence of large-scale infrastructure associated with the power stations and overhead line and associated towers which cross both the adjoining Sub-Areas and the southern part of the Wall Coast and Common Sub-Area. Consequently, any visible works and vertical elements would be incremental to rather than new, characterising influences being perceived from within a landscape where this infrastructure has been a long-established vertical feature of both internal and outward views.

14.10.49. Whilst reference to the ZTV in **Figure 14.2** indicates extensive intervisibility with the most elevated of the Proposed Works within this landscape, the smaller field pattern and higher incidence of vegetation along the drainage ditches (not accounted for in the ZTV), allied with increasing separation distance means that the geographical influence of the Proposed Works on the landscape is likely to be reduced.

14.10.50. During the Preparations for Quiescence, the magnitude of change would be Low giving rise to a **Moderate/Minor** and **Not Significant** adverse effect within the LCA Sub Area. This would reduce to a **Minor** and **Not Significant** level of effect at the end of the Preparations for Quiescence phase which would be neutral. The duration of these effects would be medium-term but leading to long-term effects for those components of the Proposed Works that would be retained through the Quiescence phase.

Cumulative effects

14.10.51. With regard to the decommissioning of HPA, the two reactor buildings play a comparable or slightly reduced landscape role to that within HPB, with ground and low-level structures having a limited characterising role upon this LCA Sub-Area due to separation distance, the presence of HPB to the east and perimeter tree cover. Consequently, the landscape effects of HPA's Preparations for Quiescence phase, which would overlap with HPB's Preparations for Quiescence phase, are anticipated to be similar. The level of landscape effect would therefore be **Moderate/Minor** and **Not Significant** from within the Quantock Vale – Wall Common and Coast Sub-Area. HPA is likely to enter into its Quiescence phase during HPB's Preparations for Quiescence phase when effects on the landscape would reduce to **Minor**, neutral and **Not Significant**.

14.10.52. In relation to the HPC, the LVIA[23] concluded that a **Minor** and adverse **Not Significant** effect would occur within the LCA Quantock Vale - Wall Common and Coast Sub-Area at during the construction phase, with a **Minor**, neutral and **Not Significant** effect predicted for both Year 1 and Year 15 of the operational phase.

Quiescence phase

Proposed Works only

14.10.53. The upper façades of the Safestore would be visible to varying degrees above or through the perimeter trees belts which would contain and screen the lower parts of the building. The Safestore building itself is assumed to retain the same footprint, colour pallet and massing of the previous reactor building and would not therefore present as a new feature from within the surrounding landscape. When assessed against the baseline, the magnitude of change would be Very Low and the level of effect within the LCA Sub-Area would be **Minor** and **Not Significant**. Landscape effects would be neutral and the duration of these effects would be long term.

Cumulative effects

14.10.54. The Quiescence phase of HPA would run concurrently (at least partially) with that of HPB and would have comparable landscape effects. As such, the level of effect would be **Minor** to None, neutral and **Not Significant**.

14.10.55. At the point at which HPA enters its Final Site Clearance phase within HPB's Quiescence phase, the operation of cranes and the gradual dismantling of the HPA's two Safestores would again increase activity within the HPA site with all elevated activity perceived from within this coastal LCA Sub Area. The level of landscape effect would therefore be **Moderate/Minor,** adverse and **Not Significant**. Upon completion of HPA's Final Site Clearance phase, the absence of the large-scale built form would give rise to a Low magnitude of change with the neighbouring HPB and HPC continuing to play a landscape role. At this point, the landscape effects associated with HPA would be **Moderate/Minor** from within the LCA Sub Area, beneficial and **Not Significant**.

14.10.56. The operational HPC would continue to have a **Minor** and neutral **Not Significant** effect.

Final Site Clearance phase

Proposed Works only

14.10.57. The periodic deployment of cranes and elevated demolition activities would recommence during the Final Site Clearance phase and would be perceived from within this landscape. The presence of a newly constructed DWMC facility and any low-level activity would have limited characterising influence due to the separation distance and screening provided by perimeter woodland. The level of activity and corresponding visual disturbance during the removal of the Safestore, would be comparable to that generated during the Preparations for Quiescence phase with the presence of cranes being perceived from within a landscape where vertical electricity transmission towers have been a long-established vertical feature of both internal and outward views. As a consequence, the elevated activities associated with the Proposed Works would be contribute to a low magnitude of landscape change and short-term landscape effects during the dismantling and deconstruction would be **Moderate/Minor**, **Not Significant** and adverse due to increased site activity.

14.10.58. Following cessation of the deconstruction works, the absence of the large-scale built form, would be a noticeable change alongside the removal of HPA. This would result in a Low magnitude of change from across this LCA Sub Area and a **Moderate/Minor**, beneficial and permanent landscape effect.

14.11 Assessment of visual effects

Overview

14.11.1. The visual assessment summarises the predicted visual effects of the three phases of the Proposed Works on the views of identified visual receptors within the Study Area as follows:

- Visual effects from Viewpoints 1, 1a and 2-10 (assessed in detail in **Appendix 14B**);
- Visual effects on views from settlements and residential properties (assessed in detail in **Appendix 14.D**);
- Visual effects on views from recreational routes (assessed in detail in **Appendix 14.D**); and
- Visual effects on views from recreational destinations (assessed in detail in **Appendix 14.D**); and
- Visual effects on views from transport routes (assessed in detail in **Appendix 14.D**).

14.11.2. The assessment is accompanied by baseline views from 11 viewpoint locations which are illustrated in **Figures 14.4** to **14.14**.

14.11.3. The ZTV, viewpoint assessment and subsequent viewpoint analysis indicates that significant visual effects likely to result from the Proposed Works would affect locations within approximately 1.3 km of the Works Area (1.5 km from the existing reactor building), particularly from within the low-lying coastal landscape to the east. Taking a precautionary approach, drawing from best practice guidance, the visual assessment has therefore been focused on receptors within 3 km.

Visual effects from Viewpoints 1-10

14.11.4. The visual effects likely to be experienced at viewpoint locations agreed with consultees are assessed in detail in **Appendix 14B**. This provides, for each viewpoint:

- A description of the viewpoint location and baseline view with reference to **Figures 14.4 to 14.14**;
- Discussion and conclusion of the sensitivity of the receptor at the viewpoint, taking account of visual susceptibility and value in accordance with the methodology in **Appendix 14A**;
- Detailed rationale of the changes to the view which are predicted to occur during the three temporal phases (Preparation for Quiescence phase, Quiescence phase and Final Site Clearance) to determine the likely magnitude of visual change; and
- The type and level of visual effect both in isolation and in-combination with cumulative developments.

14.11.5. A summary of the conclusions of the viewpoint assessment are provided in **Table 14-16**. Effects highlighted in **bold** are judged to be Significant.

Table 14-16 - Summary of Cumulative Viewpoint Analysis

Receptor	Distance from HPB reactor	Phase	Sensitivity of Receptor	Magnitude of Change	Significance	Type of effect	(Cumulative Effects Additional)	Cumulative Effects (Combined)
Viewpoint 1 King Charles III England Coast Path on the western side of Wick Moor	0.45 km	Preparations for Quiescence phase	High	Low reducing to Very Low	Moderate reducing to Moderate/ Minor	Adverse becoming neutral	Moderate reducing to Moderate/ Minor	**Moderate** (due to HPC construction) reducing to Moderate/ Minor (due to both HPA and HPC)
		Quiescence phase	High	Very Low	Moderate/ Minor	Neutral	Moderate/ Minor	Moderate/ Minor (due to both HPA and HPC)
		Final Site Clearance phase	High	Low	Moderate	Adverse becoming beneficial	N/A	N/A
Viewpoint 1a King Charles III England Coast Path to the north of HPB	Within the Works Area	Preparations for Quiescence phase	High	Medium reducing to Low	**Major/ Moderate** reducing to Moderate	Adverse becoming beneficial	Moderate reducing to Moderate/ Minor	**Major/ Moderate** (due to HPB) reducing to Moderate
		Quiescence phase	High	Low	Moderate	Beneficial	Moderate/ Minor increasing to Moderate	Moderate (due to HPA and HPB)

Receptor	Distance from HPB reactor	Phase	Sensitivity of Receptor	Magnitude of Change	Significance	Type of effect	(Cumulative Effects Additional)	Cumulative Effects (Combined)
		Final Site Clearance phase	High	Medium increasing to High	**Major/ Moderate** increasing to **Major**	Adverse becoming beneficial	N/A	N/A
Viewpoint 2 King Charles III England Coast Path within Wick Moor close to Wick Moor Drove	0.9 km	Preparations for Quiescence phase	High	Low reducing to Very Low	Moderate reducing to Moderate / Minor	Adverse becoming neutral	Moderate reducing to Moderate / Minor	**Major** to **Major / Moderate** (due to HPC)
		Quiescence phase	High	Very Low	Moderate / Minor	Neutral	Moderate / Minor	**Major / Moderate** to **Major** (due to HPC)
		Final Site Clearance phase	High	Low	Moderate	Adverse becoming beneficial	N/A	N/A
Viewpoint 3 PRoW WL 23/62 at the southern end of Wick Moor	1.3 km	Preparations for Quiescence phase	High	Low reducing to Very Low	Moderate reducing to Moderate / Minor	Adverse becoming neutral	Moderate reducing to Moderate / Minor	**Major/ Moderate** reducing to **Moderate** (due to HPC)
		Quiescence phase	High	Very Low	Moderate / Minor	Neutral	Moderate / Minor	**Moderate** (due to HPC)

Receptor	Distance from HPB reactor	Phase	Sensitivity of Receptor	Magnitude of Change	Significance	Type of effect	(Cumulative Effects Additional)	Cumulative Effects (Combined)
		Final Site Clearance phase	High	Low	Moderate	Adverse becoming beneficial	N/A	N/A
Viewpoint 4 King Charles III England Coast Path close to the settlement of Stolford	1.5 km	Preparations for Quiescence phase	High	Medium/Low reducing to Low	**Moderate**	Adverse becoming beneficial	**Moderate**	**Major/ Moderate** becoming **Moderate** (due to HPC)
		Quiescence phase	High	Low	Moderate	Beneficial	Moderate	**Moderate** (due to HPC)
		Final Site Clearance phase	High	Medium/Low increasing to Medium	**Moderate to Major/ Moderate**	Adverse becoming beneficial	N/A	N/A
Viewpoint 5 Minor road to the south of the Site (near Gunter's Grove)	1.9 km	Preparations for Quiescence phase	Medium	Medium/Low reducing to Very Low	Moderate reducing to Minor	Adverse becoming neutral	Moderate reducing to Minor	Moderate (due to HPA and HPC)
		Quiescence phase	Medium	Very Low	Minor	Neutral	Minor	Moderate (due to HPA and HPC)
		Final Site Clearance phase	Medium	Medium-Low	Moderate	Adverse becoming beneficial	N/A	N/A

Receptor	Distance from HPB reactor	Phase	Sensitivity of Receptor	Magnitude of Change	Significance	Type of effect	(Cumulative Effects Additional)	Cumulative Effects (Combined)
Viewpoint 6 PRoW WL 23/23 on the north side of the settlement of Stogursey	3.1 km	Preparations for Quiescence phase	High	Low / Very Low reducing to Very Low	Moderate / Minor	Adverse becoming neutral	Moderate / Minor	Moderate (due to HPC)
		Quiescence phase	High	Very Low	Moderate / Minor	Neutral	Moderate / Minor	Moderate (due to HPC)
		Final Site Clearance phase	High	Low/Very Low	Moderate / Minor	Adverse becoming beneficial	N/A	N/A
Viewpoint 7 PRoW BW 32/1 at Stockland Bristol	3.6 km	Preparations for Quiescence phase	High	Low / Very Low reducing to Very Low	Moderate / Minor	Adverse becoming neutral	Moderate / Minor	**Major / Moderate** to **Moderate** (due to HPC)
		Quiescence phase	High	Very Low	Moderate / Minor	Neutral	Moderate / Minor	**Moderate** (due to HPC)
		Final Site Clearance phase	High	Low / Very Low increasing to Low	Moderate / Minor increasing to Moderate	Adverse becoming beneficial	N/A	N/A
Viewpoint 8	4.7 km	Preparations for Quiescence phase	High	Very Low reducing to Zero	Moderate / Minor reducing to None	Neutral	Moderate / Minor reducing to None	**Moderate** (due to HPC)

Receptor	Distance from HPB reactor	Phase	Sensitivity of Receptor	Magnitude of Change	Significance	Type of effect	(Cumulative Effects Additional)	Cumulative Effects (Combined)
King Charles III England Coast Path to the west of Hinkley Point		Quiescence phase	High	Zero	None	Neutral	None	**Moderate** (due to HPC)
		Final Site Clearance phase	High	Very Low reducing to Zero	Moderate / Minor reducing to None	Neutral	N/A	N/A
Viewpoint 9 PRoW BW 25/7/River Parrett Trail/England Coast Path within Steart Marshes	4.9 km	Preparations for Quiescence phase	High	Very Low	Moderate / Minor	Adverse becoming neutral	Moderate / Minor	Moderate (due to HPC
		Quiescence phase	High	Very Low	Moderate / Minor	Neutral	Moderate / Minor	Moderate (due to HPC
		Final Site Clearance phase	High	Very Low increasing to Low/Very Low	Moderate / Minor	Adverse becoming beneficial	N/A	N/A
Viewpoint 10 PRoW BW 24/3 north of Stringston	5.2 km	Preparations for Quiescence phase	High	Very Low	Moderate/Minor	Adverse becoming neutral	Moderate / Minor	**Major / Moderate** (due to HPC construction) reducing to Moderate
		Quiescence phase	High	Very Low	Moderate/Minor	Neutral	Moderate / Minor	Moderate (due to HPC

Receptor	Distance from HPB reactor	Phase	Sensitivity of Receptor	Magnitude of Change	Significance	Type of effect	(Cumulative Effects Additional)	Cumulative Effects (Combined)
		Final Site Clearance phase	High	Very Low increasing to Low	Moderate/Minor increasing to Moderate	Adverse becoming beneficial	N/A	N/A

Summary of conclusions of viewpoint analysis for the proposed works

14.11.6. The viewpoint analysis indicates that significant visual effects are likely to affect locations along the low-lying coastline to the east of HPB within approximately 1.5 km distance from the existing reactor building. This would mostly affect westbound recreational walkers accessing the King Charles III England Coast Path, which coincides with the West Somerset Coast Path, from which there would be clear and direct views of the Proposed Works, including offshore works, across a moderate proportion of the horizontal field of view and as evidenced in Viewpoint 1a (**Figure 14.5a&b**) and Viewpoint 4 (**Figure 14.8**). It should be noted that there are closer viewpoint locations within this geographical range from which visual effects would not be significant due to the screening role of the perimeter woodland as observed at Viewpoints 1 and 2 (**Figure 14.4 and 14.6**).

14.11.7. A combination of factors means that changes to receptors' views from within the wider area would be not significant. This includes the existing screening role of localised landform (such as at Viewpoints 3 and 7) and intervening vegetation (as at Viewpoint 6), meaning that only the most elevated construction activities and Safestore would frequently be visible. HPC plays an emerging screening role in views from the coastline to the west of HPB, as evidenced at Viewpoint 8. Increasing separation distance (Viewpoints 9 and 10) also result in lower magnitudes of change being concluded. For all viewpoints, the reactor buildings at HPA are a feature of views as are the overhead lines and towers which cross the landscape, with the consequence that elevated activities would be viewed amongst an already developed skyline whilst ground and low-level activities would commonly be screened.

Summary of conclusions of viewpoint analysis considering cumulative effects

14.11.8. Significant visual cumulative effects as a result of the introduction of the Proposed Works would occur at Viewpoint 4 during the Preparations for Quiescence phase.

14.11.9. Significant cumulative effects as a result of other developments would occur at Viewpoints 1, 2, 3, 4, 7, 8 and 10 during HPB's Preparations for Quiescence phase and at Viewpoints 2, 3, 4, 7 and 8 during HPB's Quiescence phase. In all instances, this would be as a consequence of the construction and operation of HPC. Cumulative effects arising from the Final Site Clearance phase of the HPA Safestore buildings are assessed as beneficial in views although these effects would not be significant due to the continued visual role of HPB, HPC and the overhead lines.

14.11.10. As noted in the methodology in **Appendix 14A** and in paragraph 14.8.1, cumulative effects during the Final Site Clearance phase have not been assessed since this phase would occur in approximately 80 years' time. It is not possible to predict potential cumulative development or changes to existing / proposed developments across this time period.

Visual effects on views from settlements and residential properties

14.11.11. The visual effects likely to be experienced from settlements include consideration of residential areas, the public realm and public open spaces within the settlement boundaries that would be frequented by people. The effects on settlements within the Study Area that are overlapped by ZTV are assessed in detail in **Appendix 14.D** and summarised in **Table 14-17**.

14.11.12. In summary, there would be localised **Significant** visual effects on the views from a small number of locations on the western edge of Stolford from which views would be comparable to those for Viewpoint 4 (**Figure 14.8** and which has been assessed in detail in **Table 14B-5** of **Appendix 14B)**. Significant adverse effects may occur during peak times of activity within the Works Area during the Preparations for Quiescence phase and again during the Final Site Clearance phase. Significant beneficial effects would occur at the end of the Final Site Clearance phase for receptors in the same localised areas on the western edge of Stolford, where foreground screening (vegetation or neighbouring built form) is absent.

Table 14-17 - Summary of visual effects on views from Settlements

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Visual receptor sensitivity: High due to residential visual receptors being assessed as possessing high susceptibility in accordance with GLVIA3[9] and the high likelihood that these receptors attach medium or high value to the views that are available from the windows and curtilage of their properties.						
Stolford						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	1.1 km	Medium/Low (localised areas on western edge) Low or Very Low (majority of the settlement)	Temporary and medium term	Adverse	**Moderate** and **Significant** (localised areas on western edge). Moderate or Moderate/Minor and Not Significant (majority of the settlement).
	Post removal of buildings from the HPB site reducing built form.	1.1 km	Low (localised areas on western edge) Very Low (majority of the settlement)	Permanent	Beneficial	Moderate and Not Significant (localised areas on western edge). Moderate/Minor and Not Significant (majority of the settlement).
Quiescence phase	Presence of Safestore.	1.1 km	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant.

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.1 km	Medium/Low (localised areas on western edge) Low or Very Low (majority of the settlement)	Temporary and medium term	Adverse	**Moderate** and **Significant** (localised areas on western edge). Moderate or Moderate/Minor and Not Significant (majority of the settlement).
	Post removal of all buildings and de-licensing of site.	1.1 km	Medium/Low (localised areas on western edge) Low or Very Low (majority of the settlement)	Permanent	Beneficial	**Moderate** and **Significant** (localised areas on western edge). Moderate or Moderate/Minor and Not Significant (majority of the settlement).
Wick						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	1.1 km	Low to Very Low	Temporary and medium term	Adverse	Moderate to Moderate/Minor and Not Significant.

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
	Post removal of buildings from the HPB site reducing built form.	1.1 km	Very Low to Zero	Permanent	Neutral	Moderate/Minor to None and Not Significant.
Quiescence phase	Presence of Safestore.	1.1 km	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant.
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.1 km	Low to Very Low	Temporary and medium term	Adverse	Moderate to Moderate/Minor and Not Significant.
	Post Removal of all buildings and de-licensing of site.	1.1 km	Low to Very Low	Permanent	Beneficial	Moderate to Moderate/Minor and Not Significant.
Stogursey						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	2.7 km	Low/Very Low (northern edge of the settlement) Zero (majority of the settlement)	Temporary and medium term	Adverse	Moderate/Minor and Not Significant (northern edge of the settlement). None (majority of the settlement).
	Post removal of buildings from the HPB site reducing built form.	2.7 km	Zero	Permanent	Neutral	None

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Quiescence phase	Presence of Safestore.	2.7 km	Very Low (northern edge of the settlement) Zero (majority of the settlement)	Long-term	Neutral	Moderate/Minor and Not Significant (northern edge of the settlement). None (majority of the settlement).
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	2.7 km	Low/Very Low (northern edge of the settlement) Zero (majority of the settlement)	Temporary and medium term	Adverse	Moderate/Minor and Not Significant (northern edge of the settlement). None (majority of the settlement).
	Post Removal of all buildings and de-licensing of site.	2.7 km	Low/Very Low (northern edge of the settlement) Zero (majority of the settlement)	Permanent	Beneficial	Moderate/Minor and Not Significant (northern edge of the settlement). None (majority of the settlement).

Visual effects on views from recreational routes

14.11.13. The visual assessment has considered the potential visual effects likely to be experienced by people (walkers / cyclists / horse riders / joggers / others) on recreational routes within the Study Area. It includes national trails, regionally promoted long-distance routes and networks of local PRoWs. The detailed assessments are reported in **Appendix 14D** and summarised in **Table 14-18**, and the routes are shown in **Figure 14.15**.

14.11.14. In summary, there would be significant visual effects for westbound walkers using the King Charles III England Coast Path / West Somerset Coast Path from an approximately 2.5 km section of the routes between Stolford (close to Viewpoint 4) and the western edge of the Site during the Preparations for Quiescence and Final Site Clearance phases. For eastbound users of these routes, there would be significant effects from an approximately 750m section as it passes to the north of HPA/HPB, due to the proximity of the routes to the Proposed Works, including the offshore works associated with the CW System. From the remaining sections of King Charles III England Coast Path / West Somerset Coast Path, the Proposed Works would either be behind the viewer or increasing separation distance/presence of HPC would result in a magnitude of visual change that would not be sufficient to give rise to Significant effects.

14.11.15. Significant visual effects would also occur from a small proportion of the local routes within PRoW network D (Wick to Stolford) during the Preparations for Quiescence and Final Site Clearance phases. The worst-case scenario is likely to occur for walkers using local PRoWs 23/95, 23/107 and 23/101 close to the coastline and Viewpoint 4. For these receptors, changes would occur in direct views (i.e. immediately in front of the walker in the direction of travel) and the proximity to the Proposed Works and proportion of the horizontal fields of view which would be affected would give rise a Significant effect.

14.11.16. There would be no significant visual effects from other recreational routes as a consequence of the Proposed Works due to increasing separation distance, direction of travel and varying levels of screening from vegetation and landform.

Table 14-18 - Summary of visual effects on views from recreational routes

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Visual receptor sensitivity: High due to recreational visual receptors being assessed as possessing high susceptibility in accordance with GLVIA3[9] and the strong likelihood that these recreational receptors attach high value to the views with enjoyment and appreciation of views being an important factor in their use.						
King Charles III England Coast Path and West Somerset Coast Path (westbound walkers)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	Adjacent to the Works Area	Low (east of Stolford) Medium/Low to Medium (Stolford to the western edge of the Works Area (2.5 km section)) Zero (west of the Works Area)	Temporary and medium term	Adverse	Moderate and Not Significant (east of Stolford) **Moderate** to **Major/Moderate** and **Significant** (Stolford to the western edge of the Works Area (2.5km section)) None (west of the Works Area)
	Post removal of buildings from the HPB site reducing built form.	Adjacent to the Works Area	Very Low (east of Stolford)	Permanent	Beneficial	Moderate/Minor and Not Significant (east of Stolford)

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
			Low (Stolford to the western edge of the Works Area (2.5 km section)) Zero (west of the Works Area)			Moderate and Not Significant (Stolford to the western edge of the Works Area (2.5km section)) None (west of the Works Area)
Quiescence phase	Presence of Safestore.	Adjacent to the Works Area	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	Adjacent to the Works Area	Low (east of Stolford) Medium/Low to Medium (Stolford to the western edge of the Works Area (2.5 km section))	Temporary and medium term	Adverse	Moderate and Not Significant (east of Stolford) **Moderate** to **Major/Moderate** and **Significant** (Stolford to the western edge of the Works Area (2.5km section))

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
			Zero (west of the Works Area)			None (west of the Works Area)
	Post Removal of all buildings and de-licensing of site.	Adjacent to the Works Area	Medium/Low to Low (east of Stolford) Medium to High (Stolford to the western edge of the Works Area (2.5 km section)) Zero (west of the Works Area)	Permanent	Beneficial	**Moderate** and **Significant** (east of Stolford) **Major/Moderate** to **Major** and **Significant** (Stolford to the western edge of the Works Area (2.5km section)) None (west of the Works Area)
King Charles III England Coast Path and West Somerset Coast Path (eastbound walkers)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	Adjacent to the Works Area	Very Low to Zero (west of HPA)	Temporary and medium term	Adverse	Moderate/Minor to None and Not Significant (west of HPA)

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
			Medium (immediately north of HPA/HPB (750 m section)) Zero (east of the Works Area)			**Major/Moderate** and **Significant** (immediately north of HPA/HPB (750 m section)) None (east of the Works Area)
	Post removal of buildings from the HPB site reducing built form.	Adjacent to the Works Area	Very Low to Zero (west of HPA) Low (immediately north of HPA/HPB (750 m section)) Zero (east of the Works Area)	Permanent	Beneficial	Moderate/Minor to None and Not Significant (west of HPA) Moderate and Not Significant (immediately north of HPA/HPB (750 m section)) None (east of the Works Area)

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Quiescence phase	Presence of Safestore.	Adjacent to the Works Area	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	Adjacent to the Works Area	Very Low to Zero (west of HPA) Medium (immediately north of HPA/HPB (750 m section)) Zero (east of the Works Area)	Temporary and medium term	Adverse	Moderate/Minor to None and Not Significant (west of HPA) **Major/Moderate** and **Significant** (immediately north of HPA/HPB (750 m section)) None (east of the Works Area)
	Post Removal of all buildings and de-licensing of site.	Adjacent to the Works Area	Very Low to Zero (west of HPA) Medium to High (immediately	Permanent	Beneficial	Moderate/Minor to None and Not Significant (west of HPA) **Major/Moderate** to **Major** and **Significant** (immediately north of

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
			north of HPA/HPB (750 m section)) Zero (east of the Works Area)			HPA/HPB (750 m section)) None (east of the Works Area)
King Charles III England Coast Path (inland diversion)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	40 m	Low	Temporary and medium term	Adverse	Moderate and Not Significant
	Post removal of buildings from the HPB site reducing built form.	40 m	Very Low	Permanent	Neutral	Moderate/Minor and Not Significant
Quiescence phase	Presence of Safestore.	40 m	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	40 m	Low	Temporary and medium term	Adverse	Moderate and Not Significant

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
	Post Removal of all buildings and de-licensing of site.	40 m	Low	Permanent	Beneficial	Moderate and Not Significant
Castles & Coast Way						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	1.8 km	Low to Very Low to Zero	Temporary and medium term	Adverse	Moderate to Moderate/Minor to None and Not Significant
	Post removal of buildings from the HPB site reducing built form.	1.8 km	Very Low (coastline route to the west of HPC) Zero (majority of the route)	Permanent	Beneficial (coastline route to the west of HPC) Neutral (majority of the route)	Moderate/Minor to None and Not Significant
Quiescence phase	Presence of Safestore.	1.8 km	Very Low to Zero	Long-term	Neutral	Moderate/Minor to None and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.8 km	Low to Very Low to Zero	Temporary and medium term	Adverse	Moderate to Moderate/Minor to None and Not Significant

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
	Post Removal of all buildings and de-licensing of site.	1.8 km	Low to Very Low to Zero	Permanent	Beneficial	Moderate to Moderate/Minor to None and Not Significant
Local PRoW network A (west of HPC and Shurton Lane)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	1.5 km	Low/Very Low to Zero	Temporary and medium term	Adverse	Moderate/Minor to None and Not Significant
	Post removal of buildings from the HPB site reducing built form.	1.5 km	Zero	Permanent	Neutral	None and Not Significant
Quiescence phase	Presence of Safestore.	1.5 km	Very Low to Zero	Long-term	Neutral	Moderate/Minor to None and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.5 km	Low/Very Low to Zero	Temporary and medium term	Adverse	Moderate/Minor to None and Not Significant
	Post Removal of all buildings and de-licensing of site.	1.5 km	Low/Very Low to Zero	Permanent	Beneficial	Moderate/Minor to None and Not Significant

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Local PRoW network B (Stogursey to HPC)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	1.1 km	Low to Very Low to Zero	Temporary and medium term	Adverse	Moderate to Moderate/Minor to None and Not Significant
	Post removal of buildings from the HPB site reducing built form.	1.1 km	Zero	Permanent	Neutral	None and Not Significant
Quiescence phase	Presence of Safestore.	1.1 km	Very Low to Zero	Long-term	Neutral	Moderate/Minor to None and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.1 km	Low to Very Low to Zero	Temporary and medium term	Adverse	Moderate to Moderate/Minor to None and Not Significant
	Post Removal of all buildings and de-licensing of site.	1.1 km	Low to Very Low to Zero	Permanent	Beneficial	Moderate to Moderate/Minor to None and Not Significant
Local PRoW network C (Farrington Hill)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of	1.5 km	Low	Temporary and medium term	Adverse	Moderate and Not Significant

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
	buildings, demolition plant and waste management.					
	Post removal of buildings from the HPB site reducing built form.	1.5 km	Low/Very Low	Permanent	Beneficial	Moderate/Minor and Not Significant
Quiescence phase	Presence of Safestore.	1.5 km	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.5 km	Low	Temporary and medium term	Adverse	Moderate and Not Significant
	Post Removal of all buildings and de-licensing of site.	1.5 km	Low	Permanent	Beneficial	Moderate and Not Significant
Local PRoW network D (Wick to Stolford)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	100 m	Medium/Low to Medium (local PRoWs 23/95, 23/107 and 23/101)	Temporary and medium term	Adverse	**Moderate** to **Major/Moderate** and **Significant** (local PRoWs 23/95, 23/107 and 23/101)

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
			Low (remainder of the network)			Moderate and Not Significant (remainder of the network)
	Post removal of buildings from the HPB site reducing built form.	100 m	Low (local PRoWs 23/95, 23/107 and 23/101) Very Low (remainder of the network)	Permanent	Beneficial	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101) Moderate/Minor and Not Significant (remainder of the network)
Quiescence phase	Presence of Safestore.	100 m	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	100 m	Medium/Low to Medium (local PRoWs 23/95, 23/107 and 23/101) Low (remainder of the network)	Temporary and medium term	Adverse	**Moderate** to **Major/Moderate** and **Significant** (local PRoWs 23/95, 23/107 and 23/101) Moderate and Not Significant (remainder of the network)

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
	Post Removal of all buildings and de-licensing of site.	100 m	Medium (local PRoWs 23/95, 23/107 and 23/101) Low (remainder of the network)	Permanent	Beneficial	**Major/Moderate** and **Significant** (local PRoWs 23/95, 23/107 and 23/101) Moderate and Not Significant (remainder of the network)
Local PRoW network E (Stolford to Stockland Bristol)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	1.5 km	Low to Low/Very Low	Temporary and medium term	Adverse	Moderate to Moderate/Minor and Not Significant
	Post removal of buildings from the HPB site reducing built form.	1.5 km	Very Low	Permanent	Neutral	Moderate/Minor and Not Significant
Quiescence phase	Presence of Safestore.	1.5 km	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	1.5 km	Low to Low/Very Low	Temporary and medium term	Adverse	Moderate to Moderate/Minor and Not Significant

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
	Post Removal of all buildings and de-licensing of site.	1.5 km	Low to Low/Very Low	Permanent	Beneficial	Moderate to Moderate/Minor and Not Significant
Local PRoW network F (Hillside Farm to Lower Cock Farm)						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	2.8 km	Low/Very Low to Zero	Temporary and medium term	Adverse	Moderate/Minor to None and Not Significant
	Post removal of buildings from the HPB site reducing built form.	2.8 km	Zero	Permanent	Neutral	None and Not Significant
Quiescence phase	Presence of Safestore.	2.8 km	Very Low to Zero	Long-term	Neutral	Moderate/Minor to None and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	2.8 km	Low/Very Low to Zero	Temporary and medium term	Adverse	Moderate/Minor to None and Not Significant
	Post Removal of all buildings and de-licensing of site.	2.8 km	Low/Very Low to Zero	Permanent	Beneficial	Moderate/Minor to None and Not Significant

Visual effects on views from recreational destinations

14.11.17. The visual assessment has considered the potential visual effects likely to be experienced by people at recreational / visitor or tourist destinations or attractions, which are located within the Study Area and coincide with the ZTV. The detailed assessment of visual effects from recreational destinations is presented in **Appendix 14D** and summarised in **Table 14-19**.

14.11.18. In summary, there would be significant effects as a result of the Proposed Works on receptors using the Open Access Land to the east of the Works Area.

Table 14-19 - Summary of visual effects on views from recreational destinations

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Visual receptor sensitivity: High due to recreational visual receptors being assessed as possessing high susceptibility in accordance with GLVIA3[9] and the strong likelihood that these recreational receptors attach high value to the views with enjoyment and appreciation of views being an important factor in their use.						
Open Access Land: Man Moor, North Moor, Wick Moor, Great Hooks and Little Hooks, Ham, Sharpham, North Ham, Goose Marsh, Redham						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	40 m	Medium to Medium/Low to Low	Temporary and medium term	Adverse	**Major/Moderate** to **Moderate** and **Significant** to Moderate and Not Significant
	Post removal of buildings from the HPB site reducing built form.	40 m	Low	Permanent	Beneficial	Moderate and Not Significant
Quiescence phase	Presence of Safestore.	40 m	Very Low	Long-term	Neutral	Moderate/Minor and Not Significant
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	40 m	Medium to Medium/Low to Low	Temporary and medium term	Adverse	**Major/Moderate** to **Moderate** and **Significant** to Moderate and Not Significant
	Post Removal of all buildings and de-licensing of site.	40 m	Medium to Low	Permanent	Beneficial	**Major/Moderate** and **Significant** to Moderate and Not Significant

Visual effects on views from transport routes

14.11.19. The effects on views from transport routes within the Study Area that are overlapped by the ZTV are assessed in detail in **Appendix 14D** and summarised in **Table 14-20.**

14.11.20. In summary, there would be no significant visual effects from Wick Moor Drove.

Table 14-20 - Summary of visual effects on views from transport routes

Phase	Impact	Minimum separation distance	Magnitude of change	Nature of effect	Type of effect	Level and significance of effect
Visual receptor sensitivity: Medium due to vehicular visual receptors travelling on minor road being assessed as possessing medium susceptibility in accordance with GLVIA3[9] and the strong likelihood that these vehicular receptors attach medium or low value to the views with appreciation of the landscape unlikely to be a factor in their use.						
Wick Moor Drove						
Preparations for Quiescence phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of buildings, demolition plant and waste management.	350 m	Medium/Low to Low to Low/Very Low to Zero	Temporary and medium term	Adverse	Moderate to Moderate/Minor and Not Significant to None
	Post removal of buildings from the HPB site reducing built form.	350 m	Low/Very Low to Zero	Permanent	Beneficial	Moderate/Minor and Not Significant to None
Quiescence phase	Presence of Safestore.	350 m	Very Low	Long-term	Neutral	Minor and Not Significant to None
Final Site Clearance phase	Deconstruction activity on the HPB site including presence of cranes, physical removal of the building, demolition plant and waste management.	350 m	Medium/Low to Low to Low/Very Low to Zero	Temporary and medium term	Adverse	Moderate to Moderate/Minor and Not Significant to None
	Post Removal of all buildings and de-licensing of site.	350 m	Medium/Low to Low to Low/Very Low to Zero	Permanent	Beneficial	Moderate to Moderate/Minor and Not Significant to None

Effects on the night-time environment

14.11.21. The Pre-application Opinion requested that consideration be given to the potential effects of lighting on night-time views and landscape character.

14.11.22. As described in the baseline in **Section 14.5**, online light pollution and dark skies mapping[21] indicates that the levels of radiance across the HPA, HPB and HPC sites are at the highest (brightest) level on the spectrum (>32 NanoWatts / cm²/sr). The existing night-time illumination within HPB reflects the use of internal lights within the transparently clad central and upper parts of the Reactor Building and windows of the Turbine Hall, together with low level 'street' lights. The latter are generally not visible as a direct static source of light due to the screening provided by perimeter vegetation.

Effects during the Preparation for Quiescence phase

14.11.23. The working hours during the Preparation for Quiescence phase would typically be 07:30 – 18:00 Monday to Friday. During the winter months, it may be necessary to operate additional and directional lighting during brief periods as follows:

- in the morning from October to February, with the maximum time period being approximately 1.5hrs during late December/early January when the latest sunrise occurs[35]; and
- in the late afternoon from October to March, with the maximum time period being 2.5hrs during mid-December when the earlier sunset occurs[35].

14.11.24. The existing security lighting would be retained through the Preparations for Quiescence phase.

14.11.25. When assessed against the night-time baseline within the Site, the seasonal nature of additional lighting, brief time periods during which it would be operational, and screening provided by perimeter vegetation, the incremental effect of lighting on receptors' views and contribution to skyglow would be Very Low. When combined with a high sensitivity visual receptor, effects would be **Moderate/Minor** and **Not Significant**.

Effects during the Quiescence phase

14.11.26. It is anticipated that lighting requirements on site would reduce during the Quiescence phase and would be limited to security lighting only. There would no longer be views of internal lighting within the Reactor Building and Turbine Hall. This would give rise to a beneficial effect on night-time views and levels of skyglow.

Effects during Final Site Clearance

14.11.27. During Final Site Clearance it is expected that additional and directional lighting would be required in areas around the Safestore and for similar time periods as described for the Preparation for Quiescence phase. The absence of lighting within the Reactor Building and Turbine Hall would continue to be a beneficial landscape and visual effect when compared to the baseline, which is only countered slightly by the requirement for season and brief periods of lighting during the Proposed Works.

[35] Based on a sunrise time of 08:16 in late December/early January and a sunset time of 16:04 in mid-December as indicated at https://www.timeanddate.com/sun/@2636828?month=1&year=2024 (Accessed August 2024)

14.12 Assessment of cumulative effects

Inter-Project Effects

14.12.1. There is the potential for landscape and visual effects associated with the Proposed Works to interact with or combine with the effects arising from other developments or projects proposed in the geographical area. In accordance with GLVIA3[9], the landscape and visual impact assessment has inherently considered the potential landscape and visual effects of the Proposed Works on their own as well as the Proposed Works with additional cumulative development to ensure a robust assessment has been undertaken.

14.12.2. These inter-project cumulative effects are also summarised within in **Chapter 21: Cumulative Effects Assessment** of this EIAR.

Intra-Project Effects

14.12.3. The landscape and visual assessment has considered the biodiversity baseline presented in **Chapter 8: Terrestrial Biodiversity and Ornithology** and the cultural and historic designations/attributes identified in **Chapter 13: Historic Environment** to inform judgements concerning the value (and sensitivity) of the landscape in **Section 14.10** (specifically **Table 14-12**, **Table 14-13**, **Table 14-14**, **Table 14-15**). However, the effects of the Proposed Works on these receptors area considered within their respective chapters.

14.12.4. A summary of the potential intra-project effects is also provided in **Chapter 21: Cumulative Effects Assessment.**

14.13 Summary of landscape, visual and cumulative effects

14.13.1. A summary of the landscape and, visual and cumulative effects are provided in **Table 14-21**. Those levels of effect that are shaded in the table and shown in bold relate to significant effects. The development contributing most to the cumulative effects is recorded in brackets.

Table 14-21 - Summary of predicted landscape, visual and cumulative effects

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
Direct effects on landscape character							
Quantock Vale - Eastern Lowlands Sub-Area	Preparation for Quiescence phase	Low (within the Works Area)	High (within the Works Area)	Moderate and Not Significant within the Works Area	Adverse	Moderate and Not Significant within the Works Area	**Major** to **Moderate** and **Significant** (HPC construction) **Major** (Year 1) to **Moderate** (Year 15) and **Significant** (coastal area around Lilstock) to Minor and Not Significant within the remainder of the LCA Sub-Area (HPC operation)
		Medium within the wider LCA Sub-Area	Low reducing to Very Low within the wider LCA Sub-Area to Zero (areas outside of the ZTV)	Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV)		Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV)	
	Quiescence phase	Low (within the Works Area) Medium within the wider LCA Sub-Area	Very Low to Zero (areas outside of the ZTV)	Minor and Not Significant to None (areas outside of the ZTV)	Neutral	Minor and Not Significant to None (areas outside of the ZTV)	**Moderate** and **Significant** (coastal area around Lilstock) to Minor and Not Significant within the remainder of the LCA Sub-Area (HPC operation)

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
	Final Site Clearance phase	Low (within the Works Area)	High (within the Works Area)	Moderate and Not Significant within the Works Area	Adverse	N/A	N/A
		Medium within the wider LCA Sub-Area	During Final Site Clearance: Low reducing to Very Low within the wider LCA Sub-Area to Zero (areas outside of the ZTV).	During Final Site Clearance: Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV).	Adverse		
			Post removal of all buildings: Medium within approximately 1.5 km to Low to Very Low to Zero (areas outside of the ZTV).	Post removal of all buildings: Moderate within approximately 1.5 km to Moderate/Minor to Minor and Not Significant to None (areas outside of the ZTV).	Beneficial		

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area	Preparation for Quiescence phase	High (west of HPC)	Low/Very Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None (west of HPC)	Adverse to Neutral	Moderate/Minor and Not Significant to None (west of HPC)	**Major** and **Significant** (HPC construction) **Moderate** and **Significant** (HPC operation)
		Medium (north of HPC/ HPA/HPB)	Medium	Moderate and Not Significant (north of HPC/ HPA/HPB)	Adverse	Moderate and Not Significant (north of HPC/ HPA/HPB)	
	Quiescence phase	High (west of HPC)	Very Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None (west of HPC)	Neutral	Moderate/Minor and Not Significant to None (west of HPC)	**Moderate** and **Significant** (HPC operation)
		Medium (to north of HPC/ HPA/HPB)	Very Low	Minor and Not Significant (north of HPC/ HPA/HPB)	Neutral	Minor and Not Significant (north of HPC/ HPA/HPB)	
	Final Site Clearance phase	High (west of HPC)	Very Low to Zero (during Final Site Clearance and post removal of all buildings)	Moderate/Minor and Not Significant to None (west of HPC)	Adverse to Neutral	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
		Medium (to north of HPC/ HPA/HPB)	Medium (during Final Site Clearance and post removal of all buildings)	Moderate and Not Significant (north of HPC/ HPA/HPB)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	
Quantock Vale - Wick Moor and Coast Sub-Area	Preparation for Quiescence phase	Medium	Low to Very Low at the end of the phase	Moderate/Minor to Minor and Not Significant	Adverse	Moderate/Minor to Minor and Not Significant	**Major** and **Significant** (HPC construction)
	Quiescence phase	Medium	Very Low	Minor and Not Significant	Neutral Beneficial within coastal areas due to the removal of built form	Minor and Not Significant	Moderate/Minor and Not Significant (HPA Final Site Clearance phase)
	Final Site Clearance phase	Medium	Low (during Final Site Clearance)	Moderate/Minor and Not Significant	Adverse	N/A	N/A
			Medium (post removal of all buildings)	Moderate and Not Significant	Beneficial		

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
Indirect effects on landscape character							
Quantock Vale - Wall Common and Coast Sub-Area	Preparation for Quiescence phase	Medium	Low to Very Low at the end of the phase to Zero (areas outside of the ZTV).	Moderate/Minor to Minor and Not Significant to None	Adverse	Moderate/Minor to Minor and Not Significant	Moderate/Minor and Not Significant (HPA Preparations for Quiescence phase)
	Quiescence phase	Medium	Very Low to Zero (areas outside of the ZTV).	Minor and Not Significant to None	Neutral	Minor and Not Significant	Moderate/Minor and Not Significant (HPA Final Site Clearance phase)
	Final Site Clearance phase	Medium	Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Visual effects on views from settlements							
Stolford	Preparation for Quiescence phase	High	Medium/Low (localised areas on western edge)	**Moderate** and **Significant** (localised areas on western edge)	Adverse	**Moderate** and **Significant** (localised areas on western edge)	**Major/Moderate** and **Significant** (HPC construction)

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
			Low or Very Low (majority of the settlement)	Moderate to Moderate/Minor and Not Significant (majority of the settlement)	Adverse	Moderate to Moderate/Minor and Not Significant (majority of the settlement)	**Moderate** and **Significant** (HPC operation)
	Quiescence phase	High	Low (localised areas on western edge)	Moderate and Not Significant (localised areas on western edge)	Beneficial	Moderate and Not Significant (localised areas on western edge)	**Moderate** and **Significant** (HPC operation)
			Very Low (majority of the settlement)	Moderate/Minor and Not Significant (majority of the settlement)	Neutral	Moderate/Minor and Not Significant (majority of the settlement)	
	Final Site Clearance phase	High	Medium/Low (localised areas on western edge)	**Moderate** and **Significant** (localised areas on western edge)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Low to Very Low (majority of the settlement)	Moderate to Moderate/Minor and Not Significant (majority of the settlement)			

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
Wick	Preparation for Quiescence phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Adverse	Moderate to Moderate/Minor and Not Significant	Moderate and Not Significant (HPC and HPA)
	Quiescence phase	High	Very Low	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	Moderate and Not Significant (HPC and HPA)
	Final Site Clearance phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Stogursey	Preparation for Quiescence phase	High	Low/Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Adverse	Moderate/Minor and Not Significant (northern edge of the settlement)	Moderate and Not Significant (HPC)
			Zero (majority of the settlement)	None (majority of the settlement)	Neutral	None (majority of the settlement)	
		High	Very Low (northern edge	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
	Quiescence phase		of the settlement)	(northern edge of the settlement)		(northern edge of the settlement)	Moderate and Not Significant (HPC)
			Zero (majority of the settlement)	None (majority of the settlement)		None (majority of the settlement)	
	Final Site Clearance phase	High	Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Zero (majority of the settlement)	None (majority of the settlement)	Neutral		
Visual effects on views from recreational routes							
King Charles III England Coast Path and West Somerset Coast Path	Preparation for Quiescence phase	High	Low (east of Stolford)	Moderate and Not Significant (east of Stolford)	Adverse	Moderate and Not Significant (east of Stolford)	**Major** and **Significant** (HPC)
			Medium/Low to Medium (Stolford to the	**Moderate** to **Major/Moderate** and **Significant** (Stolford		**Moderate** to **Major/Moderate** and **Significant**	

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
(westbound walkers)			western edge of the Works Area (2.5 km section))	to the western edge of the Works Area (2.5km section))		(Stolford to the western edge of the Works Area (2.5km section))	
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral	None (west of the Works Area)	
	Quiescence phase	High	Very Low (east of Stolford)	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	**Major** and **Significant** (HPC)
			Low (Stolford to the western edge of the Works Area (2.5 km section))	Moderate and Not Significant	Beneficial	Moderate and Not Significant	
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral	None (west of the Works Area)	
	Final Site Clearance phase	High	Low (east of Stolford)	Moderate and Not Significant (east of Stolford)	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
					Beneficial (post removal of all buildings)		
			Medium/Low to Medium during Final Site Clearance increasing to Medium to High post removal of all buildings (Stolford to the western edge of the Works Area (2.5 km section))	**Moderate** to **Major/Moderate** and **Significant** during Final Site Clearance **Major/Moderate to Major** and **Significant** post removal of all buildings (Stolford to the western edge of the Works Area (2.5km section))	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)		
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral		

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
King Charles III England Coast Path and West Somerset Coast Path (eastbound walkers)	Preparation for Quiescence phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Adverse/ Neutral	Moderate/Minor and Not Significant to None (west of HPA)	**Major** and **Significant** (HPC)
			Medium (north of HPA/HPB (750 m section))	**Major/Moderate** and **Significant**	Adverse	**Major/Moderate** and **Significant**	
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral	None (east of the Works Area)	
	Quiescence phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Neutral	Moderate/Minor and Not Significant to None (west of HPA)	**Major** and **Significant** (HPC)
			Low (north of HPA/HPB (750 m section))	Moderate and Not Significant (north of HPA/HPB (750 m section))	Beneficial	Moderate and Not Significant (north of HPA/HPB (750 m section))	
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral	None (east of the Works Area)	

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
	Final Site Clearance phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
			Medium during Final Site Clearance and Medium to High post removal of all buildings (north of HPA/HPB (750 m section))	**Major/Moderate** and **Significant** during Final Site Clearance **Major/Moderate** to **Major** and **Significant** post removal of all buildings	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)		
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral		

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
King Charles III England Coast Path and West Somerset Coast Path (inland diversion)	Preparation for Quiescence phase	High	Low to Zero	Moderate and Not Significant to None	Adverse	Moderate and Not Significant to None	**Major** and **Significant** (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major** and **Significant** (HPC)
	Final Site Clearance phase	High	Low to Zero	Moderate and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Castles & Coast Way	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major** to **Major/Moderate** and **Significant** (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major/Moderate** and **Significant** (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
				Not Significant to None	Beneficial (post removal of all buildings)		
Local PRoW network A (west of HPC and Shurton Lane)	Preparation for Quiescence phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate/Minor and Not Significant to None	**Major** to **Major/Moderate** and **Significant** (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major/Moderate** and **Significant** (HPC)
	Final Site Clearance phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network B (Stogursey to HPC)	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major** to **Moderate** and **Significant** (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Moderate** and **Significant** (HPC)

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network C (Farrington Hill)	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	Major/Moderate to Moderate and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Beneficial/ Neutral	Moderate/Minor and Not Significant to None	**Moderate** and **Significant** (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
Local PRoW network D (Wick to Stolford)	Preparation for Quiescence phase	High	Medium/Low to Medium (local PRoWs 23/95, 23/107 and 23/101)	**Moderate** to **Major/Moderate** and **Significant** (local PRoWs 23/95, 23/107 and 23/101)	Adverse	**Moderate** and **Significant** (local PRoWs 23/95, 23/107 and 23/101)	**Major** to **Major/Moderate** to **Moderate** and **Significant** (HPC)
			Low (remainder of the network)	Moderate and Not Significant (remainder of the network)		Moderate and Not Significant (remainder of the network)	
	Quiescence phase	High	Low (local PRoWs 23/95, 23/107 and 23/101)	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101)	Beneficial	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101)	**Major/Moderate** to **Moderate** and **Significant** (HPC)
			Very Low (remainder of the network)	Moderate/Minor and Not Significant (remainder of the network)	Neutral	Moderate/Minor and Not Significant (remainder of the network)	
	Final Site Clearance phase	High	Medium/Low to Medium during Final Site Clearance	**Moderate** to **Major/Moderate** and **Significant** during Final Site Clearance **Major/Moderate** and **Significant** post	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
			Medium post removal of all buildings (local PRoWs 23/95, 23/107 and 23/101)	removal of all buildings (local PRoWs 23/95, 23/107 and 23/101)	Beneficial (post removal of all buildings)		
			Low (remainder of the network)	Moderate and Not Significant (remainder of the network)			
Local PRoW network E (Stolford to Stockland Bristol)	Preparation for Quiescence phase	High	Low to Low/Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and **Significant** (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Moderate** and **Significant** (HPC)
	Final Site Clearance phase	High	Low to Low/Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
					Beneficial/ Neutral (post removal of all buildings)		
Local PRoW network F (Hillside Farm to Lower Cock Farm)	Preparation for Quiescence phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate/Minor and Not Significant to None	Moderate and Not Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	Moderate and Not Significant (HPC)
	Final Site Clearance phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
Visual effects on views from recreational destinations							
Open Access Land: Man Moor, North Moor, Wick Moor, Great Hooks and Little	Preparation for Quiescence phase	High	Medium to Medium/Low to Low	**Major/Moderate** to **Moderate** and **Significant** to Moderate and Not Significant	Adverse	**Major/Moderate** to **Moderate** and **Significant** to Moderate and Not Significant	**Major** to **Major/Moderate** to **Moderate** and **Significant** (HPC)

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
Hooks, Ham, Sharpham, North Ham, Goose Marsh, Redham	Quiescence phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Beneficial/ Neutral	Moderate to Moderate/Minor and Not Significant	**Major/Moderate** to **Moderate** and **Significant** (HPC)
	Final Site Clearance phase	High	Medium to Medium/Low to Low	**Major/Moderate** to **Moderate** and **Significan**t to Moderate and Not Significant	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Visual effects on views from transport routes							
Wick Moor Drove	Preparation for Quiescence phase	Medium	Medium/Low to Low to Low/Very Low to None	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and **Significant** (HPC)
	Quiescence phase	Medium	Very Low to Zero	Minor and Not Significant to None	Neutral	Minor and Not Significant to None	**Moderate** and **Significant** (HPC)
	Final Site Clearance phase	Medium	Medium/Low to Low to Low/Very Low to None	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of change	Level of effect	Type of effect	Cumulative effects (additional)	Cumulative effects (combined)
					Beneficial (post removal of all buildings)		

15

Noise and Vibration

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15 Noise and vibration

15.1 Introduction

15.1.1. This chapter considers potential noise and vibration effects associated with the Proposed Works at relevant receptors within the vicinity of the Indicative Dismantling Works Area (hereafter the "Works Area"), inclusive of operational areas within the Hinkley Point B Nuclear Site Licence Boundary (hereafter referred to as 'The Site').

15.1.2. The chapter should be read in conjunction with **Chapter 2: The Decommissioning Process** and relevant parts of other chapters, particularly **Chapter 16: Traffic and Transport**, where common receptors have been considered with respect to a relationship between traffic generation and a change in the noise environment, and **Chapter 8: Terrestrial Biodiversity and Ornithology**, where potential noise impacts to protected species and designated habitats are considered.

15.1.3. This chapter is supported by the following figures provided in Volume II of this Environmental Statement (ES):

- **Figure 15.1**: Study Area with monitoring and receptor locations

15.1.4. This chapter is also supported by the following appendices provided in Volume III of this ES:

- **Appendix 15A:** Noise Level Predictions

15.2 Relevant legislation, policy and technical guidance

Legislation

15.2.1. The legislation in **Table 15-1** is relevant to the assessment of the effects of the decommissioning of Hinkley Point B Nuclear Power Station (HPB) upon nearby receptors:

Table 15-1 - Legislation relevant to noise and vibration

Legislation	Legislation Issue
Control of Pollution Act 1974 (CoPA)[1]	Makes provision for the agreement of noise levels and methods of working with Local Authorities such that working in accordance with the agreement is a defence against any prosecution under the Act. The Act established the concept of “Best Practicable Means” (BPM) as a defence against prosecution under the act. The Act also enables the preparation of approved codes of practice (COP) for various sources.

[1] UK Government (1974). Control of Pollution Act 1974. (Online) Available at: Control of Pollution Act 1974 (legislation.gov.uk) (Accessed August 2024).

Legislation	Legislation Issue
Environmental Protection Act 1990 (EPA)[2]	Further establishes the BPM defence. The Act also establishes that noise from premises and also individual vehicles on the public highways can be a statutory nuisance if they are a nuisance or prejudicial to health. The act also clarifies that noise from road traffic on the public highway is not a nuisance.

Policy

15.2.2. A summary of the relevant policies is given in **Table 15-2**.

Table 15-2 - Policy relevant to noise and vibration

Policy Reference	Policy Relevance
National policy	
National Planning Policy Framework (NPPF) (2023)[3]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works. The NPPF advises that significant adverse impacts on health and the quality of life as a result of noise from new development should be avoided. It also advises that other adverse impacts on health and quality of life arising from noise from new development should be reduced to a minimum. Paragraph 180 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst other considerations): "*Preventing new and existing development from contributing to, being put at unacceptable risk from,*

[2] UK Government (1990). Environmental Protection Act 1990 (Online) Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents (Accessed August 2024).
[3] Ministry of Housing, Communities and Local Government (2021). National Planning Policy Framework. (Online) Available at: https://assets.publishing.service.gov.uk/media/669a25e9a3c2a28abb50d2b4/NPPF_December_2023.pdf (Accessed August 2024).

Policy Reference	Policy Relevance
	or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability". The NPPF goes on to state in paragraph 191 that "*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:* • *mitigate, and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;* • *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."* The NPPF document does not refer to any other documents regarding noise other than the Noise Policy Statement for England (NPSE). Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above, these need to be considered in the context of the application.
Noise Policy Statement for England (NPSE) (2015)[4]	The NPSE introduces concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation (WHO). They are: **NOEL – No Observed Effect Level**: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

[4] DEFRA, 2010. Noise Policy Statement for England. (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf (Accessed August 2024).

Policy Reference	Policy Relevance
	LOAEL – Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected. Extending these concepts for the purpose of the NPSE leads to the concept of a significant observed adverse effect level. **SOAEL – Significant Observed Adverse Effect Level**: This is the level above which significant adverse effects on health and quality of life occur. It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. The first aim of the NPSE is: "*Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development*." The second aim is: "*Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development*." The third aim of the NPSE is: "*Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development*." Further guidance on the different effect levels is provided in Planning Practice Guidance – Noise (PPG-N)[5].

[5] Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government (2019) Planning Practice Guidance – Noise. (Online) Available at: https://www.gov.uk/guidance/noise--2 (Accessed August 2024).

Policy Reference	Policy Relevance
Local policy	
Adopted West Somerset Local Plan to 2032 (2016)[6]	Policy NH9 'Pollution, Contaminated Land and Land Instability' states: "*Development that generates atmospheric emissions which would cause harm to human health, senses or property will not be permitted and where such uses exist the local planning authority will not permit sensitive other uses within a reasonable distance of such uses.* *Proposals for development involving potential noise nuisance to existing occupiers of land or buildings will only be permitted when measures to minimise the impact of noise likely to be generated are incorporated as part of the development …* *There is potential for an unacceptable level of nuisance by the increase in the existing level of noise, unless appropriate noise mitigation measures are incorporated in the design of the development*."
Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) (2020)[7]	Policy 9a/5 states that "…*air quality, pollution, contaminated land, noise, nuisance, smell, land instability*" should be considered in planning applications. As stated in **Chapter 4: Policy and Legislation Overview**, the former Somerset West and Taunton Council (SWT) is no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council.

[6] West Somerset Council (2016) West Somerset Local Plan to 2032 (Online] Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (Accessed August 2024).

[7] Somerset West and Taunton Council (2020). Somerset West and Taunton Local Plan 2040 Issues and Options Document (Online). Available at: https://democracy.somerset.gov.uk/Data/SWT%20Executive/201911201815/Agenda/Appendix%20A%20Local%20Plan%20Issues%20and%20Options.pdf (Accessed August 2024).

Technical guidance

15.2.3. The technical guidance contained in **Table 15-3** is relevant to the assessment of noise and vibration effects.

Table 15-3 - Technical guidance relevant to noise and vibration

Technical Guidance	Context
The Explanatory Note to the NPSE (2010)[8]	Contains guidance to assist the technical evaluation of noise assessments and introduces three 'Effect Levels' relevant to the assessment of noise, outlined in **Table 15-2**.
Calculation of Road Traffic Noise (1988)[9]	Describes the procedures for calculating road traffic noise.
Design Manual for Roads and Bridges (DMRB) LA111: Noise and vibration (2020)[10]	Provides guidance on the assessment of impacts that road projects may have on levels of noise and vibration. Provides criteria for assessing changes in road traffic noise levels, which were used in the assessment of increases in road traffic noise, due to vehicle movements associated with the Proposed Works.
ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors: Part 2 General Method of Calculation (1996)[11]	Describes the method of calculating the attenuation of sound to predict environmental noise.
Guidelines for Environmental Impact Assessment (EIA) (2016)[12]	Presents guidelines on how the assessment of noise effects should be presented within the EIA process. The Institute of Environmental Management and Assessment (IEMA) guidelines cover aspects such as scoping, baseline, prediction and examples of significance criteria.
BS 5228-1:2009+A1:2014 Noise and vibration on construction and open sites. Part 1: Noise (2009)[13]	Provides a recommended scope for construction/demolition noise assessment (the ABC

[8] DEFRA (2010) Noise Policy Statement for England (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf (Accessed August 2024).
[9] HMSO (1988) Calculation of Road Traffic Noise.
10 Transport Scotland et al. (2020) DMRB, LA111: Noise and vibration. Revision 2 (Online). Available at: cc8cfcf7-c235-4052-8d32-d5398796b364 (standardsforhighways.co.uk) (Accessed August 2024).
[11] International Standards Organisation (1996). International Standard ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation. Geneva, ISO.
[12] Institute of Acoustics, Institute of Environmental Management and Assessment (IOA, IEMA) (2016). Guidelines for Environmental Noise Impact Assessment. London, IEMA.
[13] British Standards Institution (2014) British Standard BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise. London, BSI.

Technical Guidance	Context
	Method) as presented in Annex E. BS 5228 1 also provides example threshold values for potential significant effects at noise sensitive receptors based upon the results of ambient sound monitoring.
BS 5228-2:2009+A1:2014 Noise and vibration on construction and open sites. Part 2: Vibration (2014)[14]	Provides methods and criteria for assessing groundborne vibration, which have been used when considering the potential for significant effects due to vibration in **Section 15.9**.

15.3 Data gathering methodology

Study area

15.3.1. A Study Area encompassing the following Zones of Influence (ZoI) has been used, which includes receptors or areas which may require consideration in the assessment. The Study Area was agreed via engagement with Somerset County Council (SCC) [15] and the former SWT council. It is defined as follows:

- Approximate 2 km distance from the boundary of the Works Area; and
- Approximate 50 m distance from transport routes that may be used during the Proposed Works (see **Chapter 16: Traffic and Transport**), where a significant proportion of additional movements are expected. A screening assessment has been undertaken to determine which road links would require further assessment.

15.3.2. In general, the closest receptors to the Proposed Works and associated transport movements have been included within the assessment. In some cases, where there are receptors in close proximity to the boundary of the Study Area, they have also been included in the assessment.

Justification for determination of spatial scope of Study Area

15.3.3. With regard to noise from the Works Area, the 2 km buffer is considered robust. This is defined as per professional experience, as there is usually negligible potential for adverse effects due to noise at receptors beyond approximately 1 km from noise sources typically used at sites similar to the Proposed Works.

15.3.4. The noisiest activities anticipated during the Proposed Works are related to demolition and dismantling, which are considered 'construction' type activities for the purposes of the assessment. Therefore, the main applicable guidance to assess noise from the Proposed Works is contained

[14] British Standards Institution (2014) British Standard BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration. London, BSI.
[15] Somerset Unitary Authority was created in April 2023 and replaces Somerset County Council. The new unitary council brings together the services previously provided by the four district councils in Somerset (Mendip, Sedgemoor, Somerset West and Taunton, and South Somerset) alongside the services formerly provided by Somerset County Council. Where text refers to Somerset County Council, these discussions occurred prior to April 2023.

within BS 5228-1:2009+A1:2014[13]. The scope of BS 5228-1:2009+A1:2014[13] encompasses "*… sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites, where work activities/operations generate significant noise levels …*".

15.3.5. There is no specific guidance contained in BS 5228-1:2009+A1:2014[13] on the determination of study areas for assessment purposes. However, with regard to construction noise, DMRB LA 111[10] notes that "*A study area of 300 m from the closest construction activity is normally sufficient to encompass noise sensitive Receptors*." Based on the above it is considered that the applied 2 km buffer provides a robust basis for the purposes of ensuring that any likely affected receptor locations are included within the assessment.

15.3.6. With regard to potential noise impacts due to changes in traffic flows on vehicular access routes, DMRB LA 111[10] states that the study area for receptors near existing road links can be determined as follows: "*the area within 50m of other (i.e., not new) road links with potential to experience a short term BNL [Basic Noise Level] change of more than 1.0 dB(A) as a result of the project*". DMRB LA 111[10] notes that the determination of an appropriate study area can be varied for specific projects and also to account for the risk of likely significant effects. As such, the Study Area for potential traffic noise impacts along vehicular access routes is defined as 50 m from affected road links, subject to the initial BNL assessment to identify those links where a noise change of greater than 1 dB(A) is predicted. In accordance with DMRB LA 111[10], depending on the outcomes of the initial BNL assessment, the spatial scope of the assessments could have been expanded to account for receptors at greater distances from affected road links. However, the results of the BNL assessment (presented within **Table 15-15** and **Table 15-16**) indicates that no road links required detailed assessment, hence the Study Area was not expanded.

Desk study

15.3.7. A desktop study, based on review of aerial imagery, has been undertaken to identify receptors that could likely be affected by noise and vibration arising from the Proposed Works. The data source used in the desktop study are:

- Aerial imagery, Google Earth[16];

15.3.8. The assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of data sources. The principal data sources used to inform this chapter for potential effects comprise of the following:

- ES that accompanied the Development Consent Order (DCO) Application for Hinkley Point C Nuclear Power Station (HPC)[17].

[16] © Google (2024). Google Earth Pro Version 7.3.4.8248. (Online) Available at: Earth Versions – Google Earth (Accessed 22 March 2024).
[17] Planning Inspectorate (2011). Hinkley Point C Development Consent Order Application: Environmental Statement. (online) Available at: [ARCHIVED CONTENT] https://webarchive.nationalarchives.gov.uk/ukgwa/20190919100903/https:/infrastructure.planninginspectorate.gov.uk/projects/south-west/hinkley-point-c-new-nuclear-power-station/?ipcsection=docs (Accessed August 2024).

- Construction noise monitoring data from four locations gathered between 2016 to 2020, from ongoing construction noise monitoring for construction works at HPC[18].

15.3.9. For the undertaking of the assessment, data have been provided by the Applicant which include:

- a deconstruction plant list detailing: the zone each plant will be used in, the numbers of plant items and estimated percentage of utilisation of the plant;
- a schedule of deconstruction; and
- baseline and peak traffic flow data for 2030 and 2034.

Survey work

15.3.10. No baseline surveys have been undertaken.

15.3.11. To characterise the baseline environment, reference has been made to existing noise data obtained from the ES for HPC, and ongoing noise monitoring data obtained during construction works at HPC. This approach was discussed and agreed in consultation with representatives from SCC and the former SWT council, as set out in **Section 15.4.**

Data limitations

15.3.12. The baseline data are provided by third parties. However, the volume of data provided is considered to minimise any limitations. Furthermore, comparisons of the two baseline datasets, presented in **Table 15-8**, indicates that there is general agreement between them, further indicating that the data are representative and valid for the purposes of the assessment.

15.4 Consultation

Overview

15.4.1. To date, consultation with the Acoustics advisor at SCC and a Specialist Environmental Health Officer (Spec EHO) at the former SWT council has been undertaken to discuss and agree the methodology for establishing baseline conditions, via email and virtual meetings.

15.4.2. The proposed methodology, including the monitoring locations for which data are available, the limitations of the data, and how the data has been used, were agreed via this engagement with SCC on 22 July 2021 and with SWT on 4 October 2021.

Pre-application Opinion

15.4.3. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the assessment of effects on noise and vibration and confirmation of how these are addressed by the assessment is included in **Table 15-4**.

[18] Ben Crisp, NNB Site Environmental Engineer, HPC Construction Site. 'HPC monitoring data.xlsx' received via email 12 July 2020. NNB Generation Company Ltd.

Table 15-4 - Summary of Pre-application Opinion Responses

Paragraph ref.	Consideration	How addressed in the ES
39	Lack of evidence to support conclusion of scoping exercise: *"limited info on deconstruction methods to inform noise assessment …"*	A demolition programme with a plant list has been provided(see **Chapter 2: Decommissioning Process**). Where information is not available the assessment has been undertaken on a 'worst case' basis.
42	*"Through the iterative EIA process, further scoping should be undertaken on those receptors/ effects that have not been considered sufficiently* *…* *Impacts to noise sensitive receptors.* *Further specific examples are provided in Appendix 2."*	It is considered that potential impacts to Noise-Sensitive Receptors have been addressed sufficiently on the basis of the information available and that the Study Areas and assessment approach capture any significant effects that could occur during the project. It is considered that, if in any refinements were to be carried out, these would tend towards reductions in study areas and/ or receptors considered, rather than an expansion of scope. Based on the above, we consider that no further scoping/ consultation on this matter was required
51	Where multiple study areas have been defined for a topic area, it should be clear how they have been defined and whether they are the study areas for the purposes of the scoping exercise or the EIA. ….. In addition, in Chapter 14 (Noise and Vibration), three study areas are defined but it is unclear how these study areas have been justified and which will be used for the scoping of the EIA.	The Study Areas defined in the Scoping Report have been maintained in this assessment. The Study Areas were agreed in technical engagement with the LPAs who were satisfied with the Study Areas proposed. The determination of the Study Areas was based on relevant guidance and professional experience of assessing similar schemes and is considered robust for the purposes of the EIA.

Paragraph ref.	Consideration	How addressed in the ES
Appendix 2, baseline section (page 34)	Lack of baseline for vibration sources. Lack of info relating to potential offshore activities (baseline) that could inform the biodiversity assessment.	The assessment of construction vibration relies on absolute limits, and construction sources are transient and geographically limited, therefore there is no requirement to determine vibration baseline to inform the assessment of construction vibration. A worst-case assessment of construction vibration was presented in the Scoping Report which indicated that there would not be any significant effects due to construction vibration, and was therefore proposed to be scoped out. Activities in the marine environment and the potential for underwater noise effects are considered in **Chapter 9: Marine Biodiversity**.
Appendix 2, proposed EIA scope section (page 36)	Receptors restricted to dwellings. Insufficient evidence to demonstrate why dwellings scoped in and why hospitals, schools and public amenity areas not considered.	There are no schools or hospitals within the Study Area. Consideration has been given to the King Charles III Coast Path and this has been included as two geographically separate receptors in the assessment.

Non-statutory consultation

15.4.4. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

15.4.5. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

15.4.6. Responses to both the first and second rounds of non-statutory consultation are presented in the **Consultation Feedback Report**. Comments relevant to the noise and vibration assessment are summarised in **Table 15-5.**

Table 15-5 Comments received during non-statutory consultation relevant to the noise and vibration assessment

Respondent	Comment received	Response
Round 1 consultation		
Sedgemoor District Council	Support for the inclusion of noise environment in scoping and that Sedgemoor area is scoped into the Study Area for both.	Comment noted.
Sedgemoor District Council	Support for the assessment approach to noise environment, noting that the Sedgemoor area is scoped into the Study Area for both.	
Round 2 consultation		
Somerset Council	Suggestion that the Environmental Management Plan will be key for dealing with noise and vibration issues.	Noted. Embedded environmental measures are defined in Section 15.6, secured via the **Environmental Management Plan**.

Technical Engagement

15.4.7. **Table 15-6** summarises the technical engagement that has been undertaken in relation to the Noise and Vibration assessment.

Table 15-6 Technical Engagement undertaken in relation to the noise and vibration assessment

Stakeholder	Meeting date	Points discussed
Somerset County Council	22 July 2021	The proposed methodology, including the monitoring locations for which data are available, the limitations of the data, and how the data will be used.
Somerset West and Taunton	04 October 2021	The proposed methodology, including the monitoring locations for which data are available, the limitations of the data, and how the data will be used.

15.5 Overall baseline

Current baseline

Qualitative consideration of context

15.5.1. HPB is located in a rural area. In the absence of Hinkley Point A (HPA), HPB and the construction of HPC, the baseline noise levels are likely, historically, to have been low. There are few roads or permanent habitations in the immediate area. Close to the shoreline, noise from the Bristol Channel would have been the predominant source characterising the acoustic environment.

15.5.2. More recently, the nearest residential properties, approximately 1.1 km to the south and west of the Site, have been subject to noise from the operation of HPB, the decommissioning of HPA and construction of HPC.

15.5.3. Noise from the operation of HPB will have included typical, steady, lower level sound from operational plant such as transformers, etc., some intermittent noise sources such as standby diesel engines and, occasionally, higher sound levels caused by short term steam venting.

15.5.4. There is currently a substantial construction programme to the west of the Site to deliver HPC, which commenced construction in 2017. HPC is planned to commence operation around the end of the decade. Due to this, construction activities at HPC are likely to still dominate the acoustic environment in the immediate vicinity of the Site during the early stages of the Proposed Works.

15.5.5. Traffic flows on the local highway network are currently influenced by staff vehicle movements, deliveries of supplies, fuel tankers and waste collection vehicles associated with HPB, vehicle movements associated with the decommissioning of HPA, and construction traffic associated with HPC. The traffic routes used to access HPB are described in **Chapter 16: Traffic and Transport**.

15.5.6. In addition to the vehicle movements described above for HPB, there are a limited number of additional vehicle movements each year transporting spent fuel flasks, which are taken to the railhead at Bridgwater, and low-level waste containers being removed from HPB. These are not known to have caused any complaints due to noise or vibration.

15.5.7. Although it is assumed that there have been some significant sources of groundborne and/or airborne noise at HPB in the past which has led to occasional enquiries received by the station, there is no evidence to suggest that noise or vibration from the operation of HPB has caused a nuisance. There is also no evidence to suggest that decommissioning activities at HPA to date have caused any significant levels of noise or vibration.

Analysis of quantitative data

15.5.8. Due to ongoing construction works at HPC, representative baseline sound levels would likely be difficult to obtain, as the intensity and location of construction activities will vary as the construction of HPC progresses. Therefore, existing sound level monitoring data (specifically, sound monitoring data obtained to inform the EIA for HPC, and construction noise monitoring data, where available), have been used to inform the assessment.

15.5.9. Baseline data obtained to inform the EIA for HPC is not influenced by noise from construction activities for HPC. Long-term construction noise monitoring data for HPC can be reviewed and analysed to remove periods most affected by construction activities, and the remaining data can be

subjected to statistical analysis to derive values representative of the quieter times less affected by construction activities. Such analysis is described further below in paragraphs 15.5.12 and 15.5.13.

15.5.10. To determine the 'without HPC construction' baseline conditions, a comparison has been made between HPC baseline monitoring data acquired in 2009, used to inform the EIA (hereafter referred to as the 2009 data) and more recent HPC construction noise monitoring data, obtained between 2016 and 2020 (hereafter referred to as the construction noise monitoring data). The noise monitoring locations are identified in **Figure 15.1**.

15.5.11. The construction noise monitoring data is limited in terms of the noise indices available. The most useful index available is the $L_{Aeq,T}$, as this best represents human perception of sound levels, and is the primary index that is widely used to define criteria for potential noise impacts.

15.5.12. Inspection of the variation in the measured construction noise monitoring data generally indicated typical diurnal variation with minimal variance over the course of the monitoring period. However, at Headweir House (south of the Site, as indicated in **Figure 15.1**), inspection of the variation in noise levels indicated a six-month period which was subject to elevated noise levels from 1 March 2019 to 1 October 2019. During this period, major earthworks were being undertaken in the southern landscape area of the HPC Site and this would have influenced the recorded noise levels at this location. This period was therefore removed from the analysis, as it was not considered representative of the pre-existing baseline for HPB given the significant separation distance with respect to the Headweir House monitoring location.

15.5.13. To provide an appropriate comparison of the construction noise monitoring data with the 2009 data, the 25th and 75th percentile levels of the construction noise monitoring data ambient sound levels have been used. As the construction noise monitoring data represents multiple years' worth of data, and the 2009 data was over a relatively limited duration, this approach is considered to provide a reasonable basis for the comparison.

15.5.14. The 25th percentile of the measured sound levels represents the upper range of the 'quietest' 25% of the measured sound levels. The 75th percentile represents the lower range of the 'loudest' 25% of the measured sound levels Analysis of the construction noise monitoring data on the range indicated by the 25th to the 75th percentiles (i.e the Inter-Quartile Range (IQR)) is considered to be a robust approach as those times when ambient sound levels were at the lowest and greatest will not influence the IQR[19].

15.5.15. **Table 15-7** provides the results of the 2009 data acquired to inform the EIA for HPC. Results are provided for measured ambient sound levels ($L_{Aeq,T}$) and for measured background sound levels ($L_{A90,T}$).

15.5.16. **Table 15-8** provides a comparison of the baseline $L_{Aeq,T}$ sound levels from the 2009 data with the measured $L_{Aeq,T}$ sound levels from the construction noise monitoring data.

[19] These times were either below the 25th percentile sound level or above the 75th percentile sound level. This approach should remove the majority of unrepresentative periods when ambient sound levels were atypically low, and those periods most affected by construction noise when ambient sound levels were atypically high.

Table 15-7 – 2009 Baseline noise monitoring data

Location ref / Description	*Measured sound pressure level, dB*					
	Day (07:00 to 19:00 hrs)		*Evening (19:00 to 23:00 hrs)*		*Night (23:00 to 07:00 hrs)*	
	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Aeq,T}$	$L_{A90,T}$	$L_{Aeq,T}$	$L_{A90,T}$
1. Northern Development Site boundary (coastal footpath)	42 - 45	36 - 37	45	41	47	42
2. Knighton Farm (residential)	44 – 48	30 – 33	37 – 41	26 – 31	43 – 46	26 – 31
3. Doggets Farm (residential	40 – 59	32 – 45	35 – 63	30 – 37	36 – 52	27 – 45
4. Wick Farm (residential)	46 – 60	37 – 46	41 – 45	35 – 41	44 – 47	36 – 38
5. Southern boundary of the Southern Land	40 – 50	32 – 35	37	29	39	29
6. Hinkley Point power station – Visitors Centre	49 – 50	46 – 48	50	48	56	50

Table 15-8 - Baseline noise monitoring data: Comparison of 2009 and HPC construction noise monitoring data

2009 Data Location ref/ description	*Nearest Construction Noise Monitoring Location (with direction and approximate distance from baseline monitoring location)*	*Measured sound pressure level, dB*					
		Day (07:00 to 19:00 hrs)		*Evening (19:00 to 23:00 hrs)*		*Night (23:00 to 07:00 hrs)*	
		HPC Baseline (2009) $L_{Aeq,T}$ (Range) (as in Table 15-7)	*HPC Construction noise monitoring data (2016 - 2020)*	*HPC Baseline (2009) $L_{Aeq,T}$ (Range) (as in Table 15-7)*	*HPC Construction noise monitoring data (2016 - 2020)*	*HPC Baseline (2009) $L_{Aeq,T}$ (Range) (as in Table 15-7)*	*HPC Construction noise monitoring data (2016 - 2020)*
2. Knighton Farm (residential)	Glebe House (90 m south)	44 – 48	47 - 57	37 – 41	42 - 57	43 – 46	41 - 58
3. Doggetts Farm (residential)	Doggetts (350 m southwest)	40 – 59	54 - 57	35 – 63	48 - 53	36 – 52	42 - 50
4. Wick Farm (residential)	Headweir House (380 m east)	46 – 60	49 - 56	41 – 45	44 - 54	44 – 47	42 - 54
5. Southern boundary of the Southern Land	Yellowdoor Cottage (200 m south)	40 – 50	46 - 52	37	39 – 47	39	35 - 45

15.5.17. The results of the comparison in **Table 15-8** indicate that the 25th percentile of the construction noise monitoring data tend to fall within, or just outside, of the range of $L_{Aeq,T}$ sound levels measured in the 2009 data. This is taken as a positive indication that the 25th percentile $L_{Aeq,T}$ sound levels indicated by the construction noise monitoring data are a reasonably accurate representation of baseline conditions in the absence of construction noise from the construction of HPC, and that any adverse weather conditions or other unrepresentative events have not unduly influenced the 25th percentile $L_{Aeq,T}$ sound levels.

15.5.18. Based on the above, it is considered that the 25th percentile $L_{Aeq,T}$ sound levels indicated by the construction noise monitoring data are representative of current baseline ambient sound levels, and are a suitable basis upon which to determine thresholds of significance for any demolition works (or other works classed as 'Construction' in accordance with BS 5228-1[13]). As the construction noise monitoring data is generally comparable with the sound levels measured in the 2009 data, this is taken as a positive indication that baseline conditions have not substantially shifted since the 2009 surveys were undertaken in the absence of HPC construction. On this basis, the measured background sound levels provided in **Table 15-7** are also considered to be representative of current baseline conditions.

Future baseline

15.5.19. The primary sound sources which influence the local acoustic environment are road traffic, local agricultural activity, activities at HPA and HPC, and natural sound sources. It is not anticipated that this situation is likely to change in the period between now and the commencement of works in the Preparation for Quiescence or Final Site Clearance phases.

15.5.20. The Preparation for Quiescence phase is anticipated to be the worst-case in respect of traffic movements. The assessment of traffic noise is therefore based on the anticipated highest annual traffic flow associated with works during Preparation for Quiescence phase, which is anticipated in 2034. Baseline traffic data have been factored against expected traffic flow changes on the local network for 2034, to provide a 'future baseline' against which the noise generated from the additional traffic associated with the Proposed Works has been compared.

15.6 Embedded environmental measures

The embedded environmental and good practice measures that will be used to control potential environmental impacts due to noise during the Proposed Works are set out below in **Table 15-9**.

Table 15-9 - Summary of Embedded Environmental Measures

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
Undertaking the Proposed Works in accordance with good practice. All noisy activities to be undertaken within hours for noisy activities for construction provided by Somerset Council, except where works need to be undertaken continuously (e.g. for any concrete pours that may be	Requirements to undertake the Proposed Works in accordance with best practice, and any other mitigation measures that may be required, will be set out in the Environmental Management Plan (EMP).	Good practice

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
required) or in case of emergencies. Where the potential for significant effects arises, applying methods, considered to be best practice, in accordance with the recommendations in BS 5228:1-2009+A1:2014[13], the approved code of practice for construction noise.		
The noise emissions from the operation of the Operational and Decommissioning Waste Processing Facilities will be managed and controlled through appropriate provisions in an Integrated Management System implemented by the licensee.	Requirements to operate the Operational and Decommissioning Waste Processing Facilities in accordance with the Integrated Management System implemented by the licensee will be set out in the EMP.	Embedded measure
Undertake appropriate noise monitoring programme during the periods of the Preparations for Quiescence phase with the greatest intensity of simultaneous works, anticipated to occur in the years 2028 and 2031.	The methodology for the monitoring, and remedial action to be undertaken in the event that the monitoring identifies a potentially significant adverse noise impact, will be set out in the EMP.	Embedded measure
In the event of receipt of a complaint relating to noise from the Proposed Works, investigation will be carried out with appropriate control measure be applied as required. Additional mitigation measures may be specified where monitoring demonstrates that noise from the works may be giving rise to significant impacts.	The methodology for the investigation and remedial action to be undertaken in the event that the monitoring identifies a potentially significant adverse noise impact, will be set out in the EMP.	Embedded measure

15.7 Assessment methodology

15.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this noise and vibration chapter, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the noise and vibration assessment in the ES.

General approach

15.7.2. The assessment of construction and/or demolition activities has been undertaken with reference to BS 5228-1:2009+A1:2014[13] on the basis of the information provided and the representative baseline sound levels.

15.7.3. Noise levels have been predicted based on the decommissioning schedule and information on the likely plant requirements. Where information on plant was unavailable, assumptions were made using professional judgement based on experience of similar projects.

15.7.4. The assessment of road traffic noise during activities undertaken during the Preparations for Quiescence phase have been undertaken with reference to CRTN[9] and DMRB[10].

Determination of significance

15.7.5. The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the development*".

15.7.6. The EIA Regulations do not define significance and it is necessary to state how this has been defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented. **Table 15-10** details the basis for assessing receptor sensitivity.

Table 15-10 - Establishing the sensitivity of receptors

Sensitivity	Description	Examples
High	Receptors where people or operations are particularly susceptible to noise.	Residential, including private gardens where appropriate; Quiet outdoor areas used for recreation; Conference facilities; Theatre / auditoria / studios; Schools during the daytime; Hospitals / residential care homes; and Places of worship.
Medium	Receptors moderately sensitive to noise, where it may cause some distraction or disturbance.	Offices; Bars / cafes / restaurants where external noise may be intrusive; and Sports grounds where spectator noise is not a normal part of the event and where quiet conditions are necessary (e.g. tennis, golf, bowls).

Sensitivity	Description	Examples
Low	Receptors where distraction or disturbance from noise is minimal.	Buildings not occupied during working hours; Factories and working environments with existing high noise levels; Sports ground where spectator noise is a normal part of the event; Public rights of Way, where users are transient and not exposed to noise for long durations. Night clubs; and Other industrial sites.

15.7.7. The determination of the magnitude of change due to noise from demolition and deplanting activities in the Works Area is based on the ABC method, provided in Annex E of BS 5228-1:2009+A1:2014[13]. The method relies on comparing predicted noise levels with a significance threshold determined based on the measured baseline sound levels during the period when works would take place. The activities with the greatest potential to generate noise emissions are anticipated to occur during normal construction hours (i.e. weekday daytimes). The baseline survey results, a summary of which is provided in **Table 15-7**, indicate that, during normal construction hours, ambient sound levels rounded to the nearest five decibels do not exceed 60 dB $L_{Aeq,T}$. Therefore, in accordance with the ABC method, the BS 5228-1[13] significance threshold is 65 dB $L_{Aeq,T}$ for all receptors during weekday daytimes.

15.7.8. **Table 15-11** details the basis for assessing magnitude of change.

Table 15-11 - Establishing the magnitude of change

Magnitude	Criteria	Receptor type	Examples
High	Noise levels exceeding BS 5228-1[13] threshold for a duration which triggers the requirement to provide additional noise insulation/ temporary rehousing.	Residential buildings, hotels and hostels, buildings in religious use, buildings in educational use and buildings in health and/ or community use.	Levels very much greater than baseline and very disruptive.
Medium	Noise levels exceeding BS 5228-1 threshold for a duration which does not trigger the requirement to provide additional noise insulation/ temporary rehousing.		Levels greater than baseline and disruptive.

Magnitude	Criteria	Receptor type	Examples
Low	Noise levels equal to, but not exceeding, BS 5228-1[13] threshold.		Levels greater than baseline.
Negligible	Noise levels not exceeding BS 5228-1[13] threshold.		Levels less than baseline.

15.7.9. **Table 15-12** provides the proposed impact magnitude categories for assessing traffic noise associated with the Proposed Works, determined based on the guidance contained within DMRB[10] and using professional judgement. This is based on Basic Noise Level (BNL) calculations indicating the increase in road traffic noise level due to increases in flows on the highway network due to additional vehicle movements generated by the Proposed Works. The BNL is the calculated sound level due to road traffic, accounting for the traffic flow, speed and percentage of HGVs, at 10 m from the carriageway edge, as set out in CRTN[9].

Table 15-12 - Establishing the magnitude of impact at receptors due to increased road traffic noise associated with the Proposed Works

Magnitude	Increase in BNL of closest public road used for construction traffic (dB)
High	Greater than or equal to 5.0
Medium	Greater than or equal to 3.0 and less than 5.0
Low	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

15.7.10. **Table 15-13** below provides the matrix which has been used to determine the significance of effects based on the sensitivity of the receptor and the predicted impact magnitude.

15.7.11. The additional diagonal of ‘potentially significant’ effects reflects the complex nature of noise impact assessment, which often relies not only on the difference between the predicted sound level and the baseline sound level, but also on absolute levels, the total ambient sound level, and other factors such as the time of day, the character of the sound, the duration that a sound may be present for, etc. This approach allows for appropriate application of professional judgement in cases where there are various factors to consider when determining the significance of effects.

Table 15-13 – Significance evaluation matrix

		Magnitude of impact			
Receptor Sensitivity		**High**	**Medium**	**Low**	**Negligible**
	High	Major (Significant)	Moderate or Major (Potentially Significant)	Moderate (Potentially significant)	Minor (Not Significant)
	Medium	Moderate or Major (Potentially Significant)	Moderate (Potentially significant)	Minor (Not Significant)	Negligible (Not Significant)
	Low	Moderate (Potentially significant)	Minor (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

Note: Significant effects are those identified as 'Major'. 'Moderate effects are listed as potentially significant, as these would normally be deemed to be significant. However, there may be some exceptions, depending on the context of the scenario.

15.8 Assumptions and limitations

15.8.1. Baseline data available from the HPC EIA[20], and ongoing construction noise monitoring at HPC, has been used to inform the assessment. It is considered un-necessary to acquire any additional baseline data. This approach yields a robust and conservative assessment because baseline sound levels at receptors nearest to the Site will have been lower before the construction of HPC (see **Table 15-7** and **Table 15-8**). Acquisition of additional baseline data would likely be confounded by ongoing construction activity at HPC. This approach has been discussed and agreed with key stakeholders, as described in **Section 15.5**.

15.8.2. Noise and vibration emissions during the Proposed Works are subject to control, through best practice measures and any additional measures required, that will be set out in an EMP.

15.8.3. The Proposed Works are separated into three distinct phases, as detailed in **Section 15.9**. It is assumed that the Preparations for Quiescence phase will be the worst-case phase due to the nature of the works required during this phase. Phases of a similar but lesser intensity than the worst-case phase may be addressed qualitatively, applying professional judgement.

15.8.4. Optioneering is ongoing with respect to the construction and operation of the OWPF and DWPF. However, in the context of the other plant and activities in the Preparations for Quiescence phase, the construction and operation of the OWPF and DWPF are not considered to provide a significant

[20] EDF Energy Ltd (2009). Hinkley Point C, Pre-Application Consultation, Appendix A.1 Environmental Status Report.

contribution to noise emissions from the Proposed Works. This is discussed further in **Section 15.9**, below.

15.9 Scope of the assessment

Study area

15.9.1. The Study Area has been defined with reference to the nearest noise and vibration sensitive receptors to the Works Area and the potential transport access routes. Potential adverse noise effects will likely be confined to those receptors in closest proximity to the Works Area and the selected receptors on the traffic route. The location of the Works Area is shown on **Figure 15.1**.

15.9.2. The temporal scope of the assessment for noise and vibration is consistent with the period over which the Proposed Works will be carried out, as described in **Chapter 2: The Decommissioning Process**.

Potential receptors

15.9.3. The nearest residential properties to the Works Area lie to the south and east and are identified in **Table 15-14**. Receptors R1-R7 are indicated by the corresponding construction noise measurement locations in **Figure 15.1**. The village of Stolford (R5) lies east of the Works Area, and west of Gorpit Lane (see **Figure 15.1**).

Table 15-14 - Receptors Subject to Potential Effects

ID	Receptor	Approximate distance and direction from the Works Area
R1	Knighton / Glebe House	1.9 km south-west
R2	Shurton/ Yellowdoor Cottage	1.4 km south
R3	Doggetts Nordheide	1.2 km south
R4	Wick Farm/ Headweir House	1 km south
R5	Stolford	1.2 km east
R6	King Charles III Coast Path Position A	0.3 km east[1]
R7	King Charles III Coast Path Position B	0.5 km south-east[1]

[1] Distance measured to the centre of the Works Area

15.9.4. All receptor locations in **Table 15-14** have been assessed for effects due to the Proposed Works. Other receptors within 50 m of key transport links may also be included within the assessment, and where a significant increase in additional movements are expected. Characterisation of the main routes for road traffic to access HPB are provided in **Chapter 16: Traffic and Transport**.

Likely significant effects

Noise emissions from Works Area

15.9.5. Significant effects could occur during the Proposed Works, which are planned to occur over three phases as follows:

- Preparations for the Quiescence phase:
    - Main hub of activity with deplanting, demolition, construction and operation of the OWPF and DWPF, and Safestore construction, over a period of approximately 13 years.
- Quiescence phase:
    - Works in this phase are expected to result in the lowest noise emissions as Quiescence takes place over a duration of approximately 70 years, when monitoring and maintenance of the Safestore will be the primary activities taking place at the Site and no activities with significant noise generation potential are scheduled to take place.
- Final Site Clearance:
    - Re-activity on site dismantling of the reactors, retrieval of waste from debris vaults, removal of the Safestore and subsequent transfer onwards from the Site and final site re-instatement to end state occurring concurrently.

15.9.6. Based on the above, the Preparations for Quiescence phase is expected to be the worst-case phase of the Proposed Works with respect to noise and vibration effects. This is on the basis that this phase will require the most substantial dismantling, demolition and construction activities and therefore require the most plant and equipment and entail the greatest number of vehicle movements when compared to the Quiescence phase and Final Site Clearance.

15.9.7. During the Preparations for Quiescence phase, the majority of the Proposed Works, such as conventional deplanting and deconstruction and Safestore construction, will be limited to normal working hours between 07:30 and 18:00 hours Monday to Friday. There may be occasional infrequent exceptions to when the working day may be extended in order to complete specific items of work safely.

15.9.8. Optioneering is ongoing with respect to the OWPF and DWPF. However, in the context of the other plant and activities in the Preparations for Quiescence phase, the construction and operation of the OWPF and DWPF are not considered to provide a significant contribution to noise emissions from the Proposed Works. The proposed embedded measures (see **Table 15-9**) will control noise emissions during with the construction and operation of the OWPF and DWPF and ensure that the facilities will not result in significant effects in isolation or in combination with any other element of the Proposed Works.

15.9.9. During the Quiescence phase, works on site would be infrequent. However, it is anticipated that any site monitoring or maintenance works would also be focused within normal working hours. During Final Site Clearance, it is likely the majority of works would be focused during normal working hours similar to the Preparations for Quiescence phase, although some shift working may be required.

Increase in road traffic noise due to additional vehicle movements on the local highway network

15.9.10. Significant effects due to road traffic noise could occur at the nearest Receptors adjacent to the vehicular routes used to access the Works Area due to additional vehicle movements generated by the Proposed Works.

15.9.11. In accordance with the guidance on study areas in paragraph 3.8 of DMRB LA 11110, the Study Area for traffic noise impacts is defined as 50 m from the kerb of any road with a predicted increase in BNL of at least 1 dBA, which is considered to be the minimum perceivable increase in noise to the human ear.

15.9.12. As set out in **Chapter 2: The Decommissioning Process**, a profile of transport movements was produced from combining the programme for waste generation on-site from deplanting and demolition activities, requirements for deliveries to site of materials and plant for the Proposed Works and the potential requirement for importing of infill material for voids. This identified the peak year for HGV movements during the Preparations for Quiescence phase corresponds to Year 9/10 which is approximately 2034. During the peak year, the Site is expected to average up to 30 HGV movements per day (two-way movements) on average across a working week (Monday - Friday).

15.9.13. As discussed in **Chapter 16: Traffic and Transport**, The Proposed Works are anticipated to commence in the year 2026 and HPC is expected to commence operation around the end of the decade. The peak trip generation during the Preparations for Quiescence phase is expected to occur in year 2034 (after HPC is operational). However, there is likely to be some overlap of construction traffic for both HPC and the Proposed Works during the early years of the Preparations Quiescence phase, so on this basis, two future year scenarios have been considered in the assessment: 2030 and 2034.

15.9.14. Predictions of the increase in road traffic noise due to additional vehicle movements generated by the Proposed Works are presented below in **Table 15-15** for all road links for which flow data have been provided, which are those links falling within the Traffic and Transport Study Area set out in **Chapter 16: Traffic and Transport**.

15.9.15. The flow data considers vehicle movements on all potential route options. The road links that have been assessed are set out in **Table 5-2** of **Chapter 16: Traffic and Transport**.

Table 15-15 – Predicted increase in road traffic noise in 2030

Link	Speed (mph)	Baseline 2022			Future Year 2030, Without Development Traffic			Future Year 2030, With Development Traffic			Predicted increase in BNL, dB		
		18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	Future year without development minus baseline year	Future year with development minus baseline year	Difference (increase due to development traffic)
A39 Quantock Rock	31	80112	12%	73.3	85106	12%	73.7	85234	12%	73.7	0.4	0.4	0.0
A39 Homberg Way	35	102443	15%	74.4	108774	15%	75.0	108902	12%	75.0	0.7	0.7	0.0
A38 Bristol Road	33	109563	17%	74.7	116288	17%	75.2	116416	15%	75.2	0.5	0.5	0.0
A38 Taunton Road	30	154933	12%	76.2	164057	12%	76.4	164185	17%	76.4	0.2	0.2	0.0
A38 Bristol Road North	30	34501	7%	69.6	37082	7%	70.0	37210	12%	70.0	0.3	0.3	0.0

Link	Speed (mph)	Baseline 2022			Future Year 2030, Without Development Traffic			Future Year 2030, With Development Traffic			Predicted increase in BNL, dB		
		18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	Future year without development minus baseline year	Future year with development minus baseline year	Difference (increase due to development traffic)
A39 between Dunball roundabout and Dunball Interchange	30	27306	11%	68.6	29490	11%	69.0	29618	7%	69.0	0.3	0.3	0.0
A38 Huntworth Lane	30	27810	8%	68.7	29917	8%	69.0	30045	11%	69.0	0.3	0.3	0.0

Table 15-16 - Predicted increase in road traffic noise in 2034

Link	Speed (mph)	Baseline 2022			Future Year 2030, Without Development Traffic			Future Year 2030, With Development Traffic			Predicted increase in BNL, dB		
		18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	Future year without development minus baseline year	Future year with development minus baseline year	Difference (increase due to development traffic)
A39 Quantock Rock	31	80112	12%	73.3	86040	12%	73.7	86169	12%	73.7	0.4	0.4	0.0
A39 Homberg Way	35	102443	15%	74.4	110024	15%	75.1	110153	15%	75.1	0.7	0.7	0.0
A38 Bristol Road	33	109563	17%	74.7	117671	17%	75.2	117800	17%	75.3	0.6	0.6	0.0
A38 Taunton Road	30	154933	12%	76.2	166398	12%	76.5	166527	12%	76.5	0.3	0.3	0.0
A38 Bristol Road North	30	34501	7%	69.6	37054	7%	69.9	37183	7%	70.0	0.3	0.4	0.1

Link	Speed (mph)	Baseline 2022			Future Year 2030, Without Development Traffic			Future Year 2030, With Development Traffic			Predicted increase in BNL, dB		
		18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	18hr AAWT	HGV %	BNL, dB L_{A10}	Future year without development minus baseline year	Future year with development minus baseline year	Difference (increase due to development traffic)
A39 between Dunball roundabout and Dunball Interchange	30	27306	11%	68.6	29327	11%	68.9	29456	11%	69.0	0.3	0.4	0.1
A38 Huntworth Lane	30	27810	8%	68.7	29868	8%	69.0	29997	8%	69.0	0.3	0.3	0.0

15.9.16. The results in **Table 15-15** indicate that no road links are predicted to experience an increase in road noise in excess of 1 dBA in 2030. The greatest increase is predicted at the A39 Homberg Way road link where an overall increase of 0.7 dB is predicted, though the results indicate that none of this increase is due to additional vehicle movements associated with the Proposed Works.

15.9.17. The results in **Table 15-16** indicate that no road links are predicted to experience an increase in road noise in excess of 1 dBA in 2034. The greatest increase is predicted at the A39 Homberg Way road link where an overall increase of 0.7 dB is predicted, though, as above, the results indicate that none of this increase is due to additional vehicle movements associated with the Proposed Works.

15.9.18. Based on the criteria outlined in paragraph 15.9.11 and the results of the initial BNL assessment outlined above, all increases in road traffic noise are likely to be imperceptible. Therefore, all road links proposed to be used during the Proposed Works are screened out, and increases in road noise are scoped out of further assessment.

15.9.19. Based on the above, and with reference to the criteria in **Table 15-12**, likely impacts due to increases in road noise are negligible. With reference to **Table 15-13**, negligible impacts to receptors of high sensitivity result in effects that are **Minor** and are **Not Significant**.

Summary

15.9.20. The likely significant noise and vibration effects taken forward for assessment are summarised in **Table 15-17**. The potential for significant effects during other activities required during the Proposed Works are considered unlikely to result in significant effects and may be addressed qualitatively. As set out in the Scoping Report, vibration effects due to additional vehicle movements on public highways and vibration effects due to any demolition, deplanting and construction activities which may be required, are considered most unlikely, and are scoped out. Therefore, the likely significant effects listed in **Table 15-17** which are scoped-in for further assessment are limited to potential effects due to airborne noise.

Table 15-17 - Likely noise and vibration effects scoped in for further assessment

Receptor	Environmental Aspects scoped in
All receptors listed in **Table 15-14**.	Effects due to noise arising from demolition and deplanting activities and vehicle movements in the Works Area (i.e. not including vehicle movements on public highways, which are scoped out of detailed assessment as set out in paragraph 15.9.18).

15.10 Assessment of effects

Preparations for Quiescence phase: noise from deplanting, demolition and other decommissioning activities in the Works Area

15.10.1. Based on review of the decommissioning schedule, two years have been selected for the assessment, based on identifying those periods with the greatest number of concurrent activities. The two years selected for assessment, and the activities occurring in those years in the zones identified in Graphic 2.4 – Location of Buildings within each Managed Retreat Building Group in **Chapter 2: The Decommissioning Process**, are as follows:

- **2028**: Operation of DWPF, operation of OWPF, Active area deplanting and Conventional area deplanting and demolition in zones 2, 3, 6 and 11.
- **2031:** Operational HAW retrieval, Operation of DWPF, operation of OWPF, Active area deplanting and Conventional area deplanting and demolition in zones 2, 4, 6 and 10.

15.10.2. Quantitative data detailing the plant requirements for the conventional area deplanting and demolition, reproduced in **Appendix 15A**, have been used to inform the assessment.

15.10.3. Other activities (operation of the OWPF, DWPF, operational HAW retrieval and offshore activities to decommission the Cooling Water Intake structure) are considered to require significantly less plant than the other elements or will occur within buildings which will provide noise attenuation, and therefore result in relatively insignificant noise emissions, and are addressed qualitatively.

15.10.4. On the basis of the above, predicted noise levels at the nearest receptor locations, and assessment against the BS 5228-1[13] threshold values are provided in **Table 15-18** and **Table 15-19** below, with prediction details provided in **Appendix 15A**. Predictions have been undertaken assuming sound propagation from the Works Area at the distances presented in **Table 15-14** which are considered to be the distances from the boundary of the Works Area to the residential receptors, which represents a worse case, and to the centre of the Works Area for the public right of way receptors which represents a spatial average of the zones. This approach is taken to provide a likely worst case for the dwellings, where receptors will be potentially affected for the duration of the Proposed Works, and to provide a typical worst case for receptors on the King Charles III Coast Path, users of which would only be exposed to noise from the Proposed Works for a very short duration.

Table 15-18 – Assessment of noise from deplanting, demolition and other decommissioning activities in the Works Area: 2028

Receptor	Predicted noise level, plant and vehicle movements, dB $L_{Aeq,T}$ (not accounting for screening or reflections)	BS 5228 threshold of significance, dBA	Threshold of significance minus predicted noise level, dBA
R1	52	65	-13
R2	55	65	-10
R3	57	65	-8

Receptor	Predicted noise level, plant and vehicle movements, dB $L_{Aeq,T}$ (not accounting for screening or reflections)	BS 5228 threshold of significance, dBA	Threshold of significance minus predicted noise level, dBA
R4	59	65	-6
R5	57	65	-8
R6	71	65	+6
R7	66	65	+1

Table 15-19 - Assessment of noise from deplanting, demolition and other decommissioning activities in the Works Area: 2031

Receptor	Predicted noise level, plant and vehicle movements, dB $L_{Aeq,T}$ (not accounting for screening or reflections)	BS 5228 threshold of significance, dBA	Threshold of significance minus predicted noise level, dBA
R1	50	65	-15
R2	53	65	-12
R3	55	65	-10
R4	57	65	-8
R5	55	65	-10
R6	69	65	+4
R7	64	65	-1

15.10.5. The results in **Table 15-18** and **Table 15-19** indicate that, during those years in the Preparations for Quiescence phase with the most activity, the worst case predicted sound levels due to conventional area deplanting and demolition exceed the BS 5228-1[13] thresholds of significance at two receptor locations. These locations are R6 and R7 (King Charles III Coast Path Position A and B).

15.10.6. At R6 and R7, and with reference to **Table 15-11** there is medium magnitude of impact during the Preparations for Quiescence phase. However, it is considered that receptors on the King Charles III Coast Path are of a low sensitivity as they will be passing through the area for a brief duration and hence are temporary, transient receptors. Therefore, with reference to **Table 15-13** impacts of medium magnitude to receptors of low sensitivity result in effects that are **Minor** and **Not Significant**.

15.10.7. On this basis, and with reference to **Table 15-11**, at all of the other receptors the magnitude of change during the Preparations for Quiescence phase is of no greater than negligible magnitude at all receptors. With reference to **Table 15-13**, impacts of negligible magnitude to receptors of high sensitivity result in effects of **Minor** and are **Not Significant**.

15.10.8. At the closest residential receptor (R4 – Wick Farm) predicted noise levels are 6 dB below the significance threshold in the 2028 assessment scenario and are 8 dB below the significance threshold in the 2031 assessment scenario. Though the determination of significance provided above is considered robust and accurate based on the information available, there are some elements of uncertainty associated with the prediction. There are some additional activities not accounted for quantitatively, as described in paragraph 15.10.3, which may contribute to noise levels at the nearest receptors, although it is anticipated that these would tend to provide a negligible contribution and would not cause a significant increase in the predicted noise levels.

15.10.9. Furthermore, the predicted noise levels in **Table 15-18** and **Table 15-19** do not include any corrections for screening, and are based on all plant listed for all the activities indicated in the schedule operating simultaneously. It is likely that a significant element of screening would be provided to certain activities due to existing structures and by local topography. It is also considered unlikely that all plant listed for each deplanting and demolition areas would actually be in operation simultaneously.

15.10.10. Notwithstanding the above, and as the Proposed Works are scheduled to occur over a long period of time, it is considered that careful management of activities should be implemented to ensure that noise emissions from the Proposed Works are minimised as far as reasonably practicable, in accordance with BPM. Noise monitoring, which is an embedded environmental measure set out in **Table 15-9**, should be undertaken during the Preparations for Quiescence phase at the boundary of the Works Area to quantify noise levels due to deplanting and demolition activities. Noise monitoring would be undertaken on a regular basis and at times with the greatest intensity of simultaneous works, anticipated to occur in the years 2028 and 2031. The methodology and requirements for the monitoring will be set out in the EMP. This is discussed further below under the heading 'Monitoring'. Monitoring is not recommended during the Quiescence phase, as minimal site activity is expected. The requirement for monitoring during Final Site Clearance shall be determined once a detailed methodology for the Final Site Clearance phase is available.

15.10.11. The management and monitoring outlined above should ensure that the influence of noise from the Proposed Works on the ambient noise environment is minimised and that exceedances of the significance threshold are avoided.

Quiescence phase and Final Site Clearance: noise from activities in the Works Area

15.10.12. The assessment of noise from activities in the Works Area during the Preparations for Quiescence phase indicates that significant effects are unlikely during the Quiescence phase and Final Site Clearance.

15.10.13. The Preparations for Quiescence phase is the most intensive phase, requiring the most significant amounts of plant and associated activity for deplanting and demolition. In contrast, the Quiescence phase is anticipated to entail relatively minimal plant requirements with minimal activity in the Works Area and the generation of fewer off site vehicle movements. Though the Final Site Clearance will entail more significant plant requirements than the Quiescence phase, it is anticipated this will be less than the Preparations for Quiescence phase.

15.10.14. Based on the above, the likely effects due to noise during the Quiescence phase and Final Site Clearance will be no greater than the effects predicted during the Preparations for Quiescence phase. As such, noise emissions during the Quiescence phase and Final Site Clearance will result in impacts of no greater than negligible magnitude at all receptors. With reference to **Table 15-13**, impacts of negligible magnitude to receptors of high sensitivity result in effects that are **Minor** and are **Not Significant**.

15.10.15. Notwithstanding the above, all activities undertaken during the Final Site Clearance, and any noisy activities required during the Quiescence phase, should be carefully managed to ensure that noise emissions from the Proposed Works are minimised as far as reasonably practicable, in accordance with BPM.

Monitoring

15.10.16. The assessment indicates that significant effects are unlikely. Undertaking the Proposed Works in accordance with BPM should ensure that noise emissions from the works are minimised and reduce the potential for any adverse impacts.

15.10.17. Notwithstanding the above, as the Preparations for Quiescence phase takes place over a long period of time, to ensure that significant effects are avoided and to provide data to inform the identification of any additional mitigation measures that could be required, it is recommended that noise monitoring be undertaken during the periods of the Preparations for Quiescence phase with the greatest intensity of simultaneous works as appropriate, anticipated to occur in the years 2028 and 2031. The noise monitoring should consist of samples at regular intervals and at specific times when the most simultaneous activities/ most intensive activities are taking place, to capture a worst case.

15.10.18. In the event of receipt of a complaint relating to noise from the Proposed Works, attended monitoring should also be undertaken at a location representative of the complainant's property. Additional mitigation measures may be specified where monitoring demonstrates that noise from the works may be giving rise to significant impacts.

15.11 Assessment of cumulative effects

Inter-project effects

15.11.1. There is the potential for noise and vibration effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

15.11.2. An assessment of inter-project effects is considered within **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-project effects

15.11.3. There is the potential for intra-project effects on amenity, ecology and heritage receptors as a result of noise and vibration impacts. An assessment of intra-project effects is provided in **Chapter 21: Cumulative Effects Assessment**, as well as inherently within the following environmental aspect chapters: **Chapter 8: Terrestrial Biodiversity and Ornithology**, **Chapter 9: Marine Biodiversity**, **Chapter 13: Historic Environment** and **Chapter 17: People and Communities**.

15.12 Summary

Table 15-20 - Summary

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
All receptors listed in **Table 15-14.**	Noise effects due to noise arising from activities in the Works Area	High (Residential) Low (Public Right of Way)	Negligible (Residential) Medium (Public right of way)	Minor (Not Significant)	Noise levels during peak years of activity are predicted not to exceed the BS 5228-113 thresholds of significance.
All receptors listed in **Table 15-14.**	Noise effects due to increased road noise from vehicle movements generated by the Proposed Works.	High (Residential) Low (Public right of way)	Negligible	Minor (Not Significant)	Assessment indicates no significant increases of road traffic noise due to the Proposed Works.
All receptors listed in **Table 15-14.**	Cumulative noise effects due to noise arising from activities in the Works Area and noise emissions from the construction and operation of other developments.	High (Residential) Low (Public right of way)	Negligible (Residential) Medium (Public right of way)	Minor (Not Significant)	Review of available information on other proposed/ consented schemes indicates that none are likely to present a significant risk of giving rise to noise emissions with the potential to cause cumulative noise effects.

All receptors listed in **Table 15-14.**	Cumulative noise effects due to increased road noise from vehicle movements generated by the Proposed Works and other proposed/ consented developments.	High (Residential) Low (Public right of way)	Negligible	Minor (Not Significant)	Assessment indicates no significant increases of road traffic noise due to the Proposed Works. As such, any significant increases would be dominated by the other proposed/ consented developments.

16

Traffic and Transport

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16 Traffic and Transport

16.1 Introduction

16.1.1. This chapter considers potential traffic and transport effects associated with the Proposed Works within the Study Area (see **Section 16.3**).

16.1.2. The chapter should be read in conjunction with **Chapter 2: The Decommissioning Process** and with respect to relevant parts of other environmental aspect chapters, notably **Chapter 6: Air Quality** and **Chapter 15: Noise and Vibration**, where there are some road links that are considered under the environmental aspect specific assessments, that have used the same traffic data to inform the assessments as relevant.

16.1.3. Underpinned by the programme of works presented in **Chapter 2: The Decommissioning Process**, the quantities of materials that will require off-site disposal and are required for on-site construction of the Safestore and to potentially fill voids on site during the Preparations for Quiescence phase have been calculated (see **Chapter 19: Conventional Waste**). These quantities have been translated into the number of Heavy Goods Vehicle (HGV) movements required to transport the waste arisings associated with dismantling and decommissioning, filling of voids on-site and the construction of the Safestore, to facilitate this traffic and transport assessment.

16.1.4. This chapter is supported by the following figures provided in Volume II of this ES:

- **Figure 16.1: Proposed Study Area**
- **Figure 16.2: Anticipated Fixed Routes for HGV**
- **Figure 16.3: ATC and DfT counter location**
- **Figure 16.4: Existing Highway Network**
- **Figure 16.5: Public Rights of Way (PRoW) in the vicinity of the study area**
- **Figure 16.6: Location of Collisions (1/4/18 to 31/3/23)**
- **Figure 16.7: Scope of Assessment**

16.1.5. This chapter is supported by the following appendices provided in Volume III of this ES:

- **Appendix 16A: Outline Construction Traffic Management Plan (CTMP)**
- **Appendix 16B: Collision Data**

16.2 Relevant legislation, policy and technical guidance

Legislation

16.2.1. The legislation in **Table 16-1** is relevant to the assessment of the effects on Traffic and Transport receptors:

Table 16-1 - Legislation relevant to Traffic and Transport

Legislation	Legislation Issue
Nuclear Corporation Agreement 2021[1]	An agreement between the UK government and the European Atomic Energy Community for cooperation on the safe and peaceful uses of nuclear energy. Any transfer of nuclear material, equipment or technology shall be made in accordance with Articles 6 and 7 and as set out in the Guidelines for Nuclear Transfers.
Energy Act 2013[2]	This act includes the mitigation of risk and outlines the security for transporting radioactive material by road, rail or inland waterway and how it is transported.
The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment (Amendment) (EU Exit) Regulations 2021[3]	Transport of dangerous goods by road, rail and inland waterway in the UK must be in accordance with these regulations. There are specific regulations contained within this document for class 7 (radiological) goods.
The Waste (England and Wales) Regulations 2011[4]	These regulations require a carrier of controlled waste to be registered for the carriage of waste.

1 Nuclear Corporation Agreement (2021) Available at: https://assets.publishing.service.gov.uk/media/608a8e3be90e076aad25a5ff/TS_10.2021_UK_EAEC_Cooperation_Safe_and_Peaceful_Uses_Nuclear_Energy.pdf (Accessed on August 2024).

2 Energy Act 2013(2013) Available at: https://www.legislation.gov.uk/ukpga/2013/32/pdfs/ukpga_20130032_en.pdf (Accessed August 2024).

3 Department of Transport (2009) The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009. Available at: https://www.legislation.gov.uk/uksi/2009/pdfs/uksi_20091348_en.pdf (Accessed August 2024).

4 The Waste (England and Wales) Regulations 2011 (2011) Available at: https://www.legislation.gov.uk/ukdsi/2011//pdfs/ukdsi__en.pdf (Accessed August 2024).

Policy

16.2.2. A summary of the relevant policies is given in **Table 16-2**.

Table 16-2 - Policy relevant to Traffic and Transport

Policy Reference	Policy Relevance
National Policies	
National Planning Policy Framework (NPPF) (2023)[5]	National policies related to traffic and transport for all modes of travel, with an emphasis on sustainable transport. The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner*". Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works. Paragraph 108 emphasises transport issues that should be considered from the earliest stages of plan-making. Paragraph 115 states development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network would be severe. Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above, these need to be considered in the context of the application. The Proposed Works have therefore been developed to minimise traffic on local highways, seeking to reuse waste where possible in line with the waste hierarchy.
Department for Transport (DfT) Circular 01/2022 Strategic Road Network and the delivery of sustainable development (2022)[6]	DfT Circular 01/2022 explains how National Highways will engage with the planning system and fulfil its remit to be a delivery partner for sustainable economic growth whilst maintaining, managing, and operating a safe and efficient Strategic Road Network (SRN).
Local Policies	
Somerset County Council Future Transport Plan 2011-2026 (2011)[7]	Somerset's transport strategy relating to freight includes a commitment to help hauliers to choose the most appropriate routes. The strategy also considers rights of way, sustainable transport and parking.

[5] Ministry of Housing, Communities & Local Government (2023). National Planning Policy Framework. Available at: National Planning Policy Framework (publishing.service.gov.uk) (Accessed August 2024).

[6] Department of Transport (2022). Strategic road network and the delivery of sustainable development. Available at : https://www.gov.uk/government/publications/strategic-road-network-and-the-delivery-of-sustainable-development/strategic-road-network-and-the-delivery-of-sustainable-development (Accessed August 2024).

[7] Somerset County Council (2011). Somerset's Future Transport Plan 2011-2026. Available at: https://www.somerset.gov.uk/roads-travel-and-parking/future-transport-plan/ (Accessed August 2024).

Policy Reference	Policy Relevance
Sedgemoor Local Plan 2011-2032 (2019)[8]	Policy D13 Sustainable Transport and Movement: development will be supported where proposals 'reduce congestion, encourage an improved and integrated transport network' and includes a statement that proposals will 'Encourage efficient, safe and sustainable freight transport.' Policy D14 Managing the Transport Impacts of Development – proposals should ensure volume and type of traffic does not 'compromise the safety and/or function of the local or strategic road networks.'
Adopted West Somerset Local Plan to 2032 (2016)[9]	Policy TR1: '*Access to and From West Somerset – Proposals for development must encourage the use of sustainable modes of transport…*'
Somerset Adopted Waste Core Strategy Development Plan Document up to 2028 (2013)[10]	DM3: impacts on the environment and local communities – mitigation should be provided for adverse impacts including those resulting from traffic. DM6: Planning permission will be granted for waste management development subject to the application demonstrating that: (a) the proposed development will not have a detrimental impact on Somerset's local and strategic road transport network…
Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) (2020)[11]	This document was part of the first consultation stage (concluding in October 2020) for the development of the new Local Plan. Objectives contained in the plan which are of potential relevance to this application includes carbon, travel, historic, economic and social themes. Objective 6: 'To achieve a major change in travel behaviour towards walking, cycling and public transport and to reduce the need to travel.' As stated in **Chapter 4: Policy and Legislation Overview**, Somerset West and Taunton Council are no longer progressing this Local Plan due to the establishment of a new unitary council in April 2023. The information gathered for this plan through consultation and evidence base will inform the Development Plan(s) for the new unitary council.

[8] Sedgemoor District Council (2019) Sedgemoor Local Plan 2011-2032. Available at: Adopted Local Plans (somerset.gov.uk) (Accessed August 2024).

[9] West Somerset Council (2016) West Somerset Local Plan to 2032. Available at: https://offlinehbpl.hbpl.co.uk/NewsAttachments/RLP/West_Somerset_Adopted_Local_Plan.pdf (Accessed August 2024).

[10] Somerset County Council (2013). Waste Core Strategy Development Plan Document up to 2028. Available at: https://www.somerset.gov.uk/planning-buildings-and-land/minerals-and-waste-planning/. (Accessed August 2024).

[11] Somerset West and Taunton Council (2020). Somerset West and Taunton Local Plan 2040 Issues and Options Document. Available at: https://democracy.somerset.gov.uk/Data/SWT/Agenda/AppendixOptions.pdf (Accessed August 2024).

Technical guidance

16.2.3. A summary of the relevant policies is given in **Table 16-3**.

Table 16-3 - Technical Guidance relevant to Traffic and Transport

Technical Guidance	Context
Environmental Assessment of Traffic and Movement (2023)[12]	The IEMA Environmental Assessment of Traffic and Movement (EATM) guidelines replace the 1993 'Guidelines for the Environmental Assessment of Road Traffic'. The EATM provides guidance to practitioners and Local Authorities for undertaking an EIA or non-statutory environmental assessment for traffic and movement of people associated with non-highway / road projects.
Planning Practice Guidance. Travel Plans, Transport Assessments and Statements (2014)[13]	This PPG was published in March 2014, and together, the PPG and the NPPF set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments.

16.3 Data Gathering Methodology

16.3.1. The following section summarises the methodology undertaken which is a combination of desk study and additional survey work to collate the relevant data for assessing the existing (baseline) conditions.

Study Area

16.3.2. The extent of the Study Area that has been adopted for the EIA has been informed by the initial discussions undertaken with Somerset County Council[14] (SCC) and National Highways on 11 August 2021 and 16 May 2022 and further defined by traffic associated with the Preparations for Quiescence phase, given that the traffic and transport impacts are predicted to be greatest during this phase.

16.3.3. The traffic and transport Study Area considered for this assessment is comprised of the following junctions and connecting highway links:

- Quantock Road;
- A39 Homberg Way;

[12] IEMA (2023) New IEMA Guidance: Environmental Assessment of Traffic and Movement (2023) Available at: https://www.iema.net/resources/blog/2023/07/12/new-iema-guidance-environmental-assessment-of-traffic-and-movement (Accessed August 2024).

[13] UK Government (2014) Travel Plans, Transport Assessments and Statements. Available at: https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements (Accessed August 2024).

[14] Somerset Unitary Authority was created in April 2023 and replaces Somerset County Council. The new unitary council brings together the services previously provided by the four district councils in Somerset (Mendip, Sedgemoor, Somerset West and Taunton, and South Somerset) alongside the services formerly provided by Somerset County Council. Where text refers to Somerset County Council, these discussions occurred prior to April 2023.

- A38 Bristol Road;
- A38 Taunton Road;
- A38 Bristol Road North;
- A39 between Dunball roundabout and Dunball Interchange; and
- A38 Huntworth Lane.

16.3.4. During the scoping stage, the traffic and transport effects on the following roads were scoped out from further assessment as agreed with SCC and National Highways:

- Cannington Bypass as it is largely free from built-up settlements and properties on the route are typically set back from the road.
- Withycombe Hill and Wick Moor Drove have several small settlements along them, such as Wick, and residential properties, such as those off Withycombe Hill outside Combwich. These roads are rural in nature and are predominantly surrounded by agricultural land with some residential properties that are set back from the carriageway, and therefore these would not be construed as sensitive receptors.
- The M5, due to it being a strategic road network where the increase in traffic due to the Proposed Works would be diluted and would not have significant impact on the existing baseline traffic levels.

16.3.5. The Study Area falls wholly within the Somerset Council Boundary. The Study Area also includes access routes to National Highways SRN.

16.3.6. The HGV routing for the Proposed Works is expected to follow the existing route used by HPC construction traffic. There are two routes available from the HPB site to join the M5, and they are presented in **Figure 16.1** and described below:

- **Northern Route (Route 1)** - starts from Wick Moor Drove via an unnamed rural road connecting Withycombe Hill and passing through Cannington Bypass before proceeding further on New Road. New Road joins A39 Quantock Road at the A39 New Road roundabout and Route 1 continues onto Homberg Way and The Drove. Route 1 joins Bristol Road (A38) at the Bristol Road traffic signal junction and then continues northwards onto the Dunball Roundabout to join the M5 at the Dunball Interchange (M5 Junction 23).
- **Southern Route (Route 2)** -This route shares the same route as Route 1 up to A39 Quantock Road. At Quantock Road / Homberg Way roundabout, Route 2 continues onto Quantock Road proceeding further Wembdon Road and joining the A38 Taunton Road at Broadway / Taunton Road traffic signal junction. Route 2 continuous southwards along the A38 Taunton Road to join the M5 at the Huntworth Interchange (M5 Junction 24).

16.3.7. The preferred route for the traffic associated with the Proposed Works is the Northern Route (Route 1); however, for robustness, the traffic and transport effects applicable to Route 1 and Route 2 have been assessed.

16.3.8. As it is expected that all transportation of materials and waste as part of the Proposed Works will be via the local highway network (using established routes used by HPC), marine and rail receptors have been scoped out due to limitations of infrastructure in the area (as set out in the Scoping Report). For example, the nearest railway station is Bridgwater Station, situated approximately 10.7 miles southwest of the Site, and would still require movements on the highway network.

Desk study

16.3.9. A desk study was undertaken using traffic data available from existing Department for Transport (DfT)'s traffic counters within the Study Area. Additional traffic surveys have also been undertaken to cover locations where the DfT count were not available (see **Survey work** section below).

16.3.10. The data gathered sets out the existing conditions of the local road network within the Study Area, as follows:

- Highway boundary data which is held by the Local Highway Authority (Somerset Council), for any locations where mitigation may be required; and
- The personal injury collision (PIC) records for the last five years (2018-2023) from Somerset Council.

16.3.11. The calculation of the background traffic growth was undertaken as follows:

- Growth factors were derived utilising the TEMPro v8 for the core growth scenario;
- Committed developments with planning permission since 2022 to April 2024 , when the traffic surveys were collected;
- Data collection of road geometries for the routes proposed to be used by articulated vehicles have been undertaken using aerial mapping derived from Google. Abnormal Indivisible Loads (AILs) (if necessary) will be undertaken separately; and
- Detailed traffic flow predictions for the Proposed Works have been calculated to compare against the baseline situation.

Survey work

16.3.12. Automatic Traffic Count (ATC) surveys were undertaken at the seven survey locations identified **Table 16-4** to record flows and speeds in both directions over a seven-day survey period. The surveys took place between 00:00 on Wednesday 06 July 2022 and 23:59 on Tuesday 12 July 2022 and are the latest ATC surveys. **Figure 16.3** represents the location of ATC surveys undertaken.

16.3.13. **Table 16-4** provides a summary of the traffic data sources.

Table 16-4 - AADT Data Sources

Link Ref	Location	Description	DfT or ATC	DfT Count Point	Year
1	Wick Moor Drove	Wick Moor Drive close to the Site	ATC - Link 1	-	2019
2	A39-Near Cannington	A39-south of Cannington	ATC - Link 2	-	2019

Link Ref	Location	Description	DfT or ATC	DfT Count Point	Year
3	Quantock Road	A39 Quantock Rock, west of Quantock Road Cemetery	ATC - Link 3	-	2019
4	A39 Quantock Rock	A39 Quantock Rock between Sandford Cor roundabout and Whitegate Roundabout	ATC - Link 4	-	2022
5	A39 Homberg Way	Between Chilton Street and The Drove	ATC - Link 5	-	2022
6	A38 Bristol Road	Between The Drove and Wylds Road	ATC – Link 6	-	2022
7	A38 Taunton Road	Near Hamp	ATC – Link 7	-	2022
8	C182	Between Junction Wick Moor and Farrington Hill	DfT	812165	2022
9	C182	Between Knaplock lane and Cockwood	DfT	810698	2022
10	Withycombe Hill	Between Brookside Road and Cannington Bypass	DfT	807585	2022
11	A38 Bristol Road North	A38 Bristol Road between A39 and Ascot Drive	DfT	6403	2022
12	A39 between Dunball Roundabout and Dunball Interchange	Between A38 and M5 J23	DfT	6416	2022
13	A38 Huntworth Lane	Between A38 Taunton Road and M5 J24	DfT	57970	2022
14	M5	Between J24 & J23	DfT	6022	2022
15	M5	Between J23	DfT	47971	2022

Note: The traffic survey and data from the DfT have been collected for the entire Study Area. However, the analysis excludes the data from specific links that were scoped out, including ATC data at link references 1, 2, and 3, as well as traffic counts at link references 8, 9, 10, 14, and 15.

Site Visit

16.3.14. A site visit was undertaken to observe Hinkley Point B (HPB), access to the site and the surrounding local highways network on 17 January 2020, prior to the UK National Lockdown for COVID-19. Access to the Site has not changed since this visit was undertaken.

16.4 Consultation

Pre-application Opinion

16.4.1. A Pre-application opinion was provided by the ONR, on 07 December 2022. A summary of the relevant responses received in the Pre-application Opinion in relation to traffic and transport and confirmation of how these have been addressed within the assessment is presented in **Table 16-5.**

16.4.2. It should be noted that since the Environmental Impact Assessment (EIA) Scoping Report was submitted to the ONR on 05 October 2022, the Guidelines for the Environmental Assessment of Road Traffic (GEART) was superseded (in July 2023); the assessment has been undertaken in accordance with the updated guidelines, as set out in **Section 16.6**.

Table 16-5 - Summary of Pre-application Opinion Responses

Paragraph Ref.	Consideration	How addressed in the ES
39	No indication of transport movements to inform the traffic and transport assessment.	All assumptions pertaining to transport movements have been based on a worst-case scenario, which is anticipated to be during the Preparations for Quiescence phase as detailed in **Section 16.8**. The anticipated trip generation for the Proposed Works (as maximum HGV and Car/LGVs vehicles per day) is presented in **Section 16.8** of this chapter and the assessment of likely significant effects is provided in **Section 16.9**.
42	Impacts from increased traffic on the highway to biodiversity and heritage receptors.	The terrestrial biodiversity assessment includes consideration of indirect effects associated with the increase of traffic (such as potential effects on air quality) on biodiversity receptors, which includes terrestrial ecological features (species, habitats and ecosystems and ornithology), is presented in **Chapter 8: Terrestrial Biodiversity** of this ES. Indirect effects on heritage receptors (such as impact on setting as a result of factors which includes a change in traffic flows) arising from the Proposed Works with respect to the historic environment is detailed in **Chapter 13: Historic Environment** of this ES.

Paragraph Ref.	Consideration	How addressed in the ES
Appendix 2	No reference made to The Guidelines for the Environmental Assessment of Road Traffic published by the Institute of Environmental Assessment in 1993 (now IEMA) or Highways England DMRB LA112 – Population and Human Reference now added. Health, in particular for guidance on determination of significance of environmental effects, reporting and monitoring.	The assessment presented in this chapter is based on the latest IEMA guidance. Further detail is provided in **Section 16.2** and **16.6** of this chapter. The assessment of likely socio-economic and health effects with respect to people and communities within the vicinity of the Proposed Works is presented in **Chapter 17: People and Communities** of this ES.
Appendix 2	In Chapter 15 (Traffic and Transport), it is unclear what is defined as a significant effect for severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation, and accidents and safety. In addition to this, information on the maximum predicted weekly movements, rather than an average, will be important in assessing the potential impacts on receptors.	The assessment criteria used within the assessment for traffic and transport to determine the likely effects on severance, driver delay, pedestrian delay, pedestrian amenity, fear and intimidation, and accidents and safety is presented in **Section 16.7** of this chapter. The anticipated trip generation for the Proposed Works (as maximum HGV and Car/LGVs vehicles per day) is presented in Section 16.8 and the. assessment of likely significant effects is provided in Section 16.9
Appendix 2	In Chapter 15 (Traffic and Transport) the scoping exercise does not consider potential impacts as a result of increased traffic on the highway to biodiversity receptors, for example, acid and nitrogen deposition should have been considered in the scoping exercise. Transport routes (including the access route) are not in the red line boundary however will be considered in the traffic and transport assessment.	The air quality assessment to assess the likely significant effects of the Proposed Works with respect to road traffic emissions and the impacts on both human and ecological receptors have been addressed in **Chapter 6: Air Quality** and **Chapter 8: Terrestrial Biodiversity** of this ES.

Non-statutory consultation

16.4.3. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

16.4.4. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the ONR and any additional information identified between Round 1 and Round 2 Consultation.

16.4.5. Responses to both the first and second rounds of non-statutory engagement are presented in the Consultation Feedback Report. Comments relevant to the traffic and transport assessment are summarised in **Table 16-6.**

Table 16-6 - Comments received during non-statutory consultation relevant to the traffic and transport assessment

Respondent	Comment received	Response
Round 1 consultation		
Sedgemoor District Council	Concern regarding additional traffic movements and requested information on the maximum predicted weekly movements rather than just the average.	Assumptions in relation to the assessment and trip generation are presented in **Section 16.8** and **Section 16.9**.
Sedgemoor District Council	Concern regarding the access to the Site via residential streets that are both narrow and have parked cars on both sides, making the movement of large HGV vehicles problematic.	The HGV routing for the Proposed Works is expected to follow the existing route used by HPC construction traffic. An outline CTMP has been developed which recognises the requirement to manage decommissioning traffic movements (see **Appendix 16A**).
Sedgemoor District Council	Requested clarification that the existing railhead in Bridgwater will not be used post defueling.	The Proposed Works are not anticipated to require use of the railhead at Bridgwater.
Round 2 consultation		
Somerset Council	Request for non-car users to be considered within the Traffic and transport assessment.	This chapter includes a review of the baseline environment with respect to traffic and transport and includes details of non-motorised users within the Study Area. There are no Public Rights of Way (PRoW) identified within vicinity of the Works Area which are likely to be directly impacted by the Proposed Works, however, in the wider Study Area, there are PRoW that intersect road links along the preferred route and King Charles III path Brean to Minehead National Trail is temporarily diverted to facilitate the construction of HPC. However, as traffic flows, at peak, will result in less than a 10% change compared to baseline levels, it was considered that effects on Non-Motorised Users (NMUs) were not likely and therefore not considered further.
Somerset Council	Concern that Public Rights of Way may come into conflict with the associated traffic, as a result of the proposed works	A desk-study has been undertaken to identify PRoW within the Study Area which may need to be closed or diverted (temporarily or permanently) to manage any potential conflict between non-motorised users and development generated traffic. Based on the current baseline, there are no PRoWs identified within vicinity of the Works Area

Respondent	Comment received	Response
		which are likely to be impacted by the Proposed Works, however, in the wider Study Area, there are PRoW that intersect road links along the preferred route and King Charles III path Brean to Minehead National Trail is temporarily diverted to facilitate the construction of HPC.
Somerset Council	Request for further information on how traffic movements will be managed.	As set out in the Construction Traffic Management Plan, the Site Licensee will consider assigning a Transport Co-ordination Officer (TCO) to govern traffic movements associated with the Proposed Works as appropriate.
National Highways	Recognition that traffic routes associated with the decommissioning proposals impact M5 Junction 24 and M5 Junction 23.	The preferred route for the traffic associated with the Proposed Works is the Northern Route (Route 1); however, for robustness, the traffic and transport assessment has assessed both routes.
National Highways	Request to ensure other projects in the area, including HPC and Gravity, are considered within the traffic and transport assessment	This chapter presents an assessment based on the worst-case scenario. As HPC has been in construction since 2017, traffic associated has been factored into the baseline traffic flows. Consideration of inter-project effects related to other committed development (including Gravity) is provided in **Chapter 21 Cumulative Effects Assessment.**

Technical engagement

16.4.6. **Table 16-7** summarises the technical engagement that has been undertaken in relation to the traffic and transport assessment.

Table 16-7 - Summary of technical engagement

Date	Consultee	Summary
11 August 2021	SCC and Highways England[15]	Focused on the scope of baseline surveys. This meeting included discussion of including 2019 (pre-pandemic) and 2020 (Covid-19 pandemic) accident data and the availability of traffic data from public sources
16 May 2022	SCC National Highways	Focused on the scope and locations for traffic counts to occur. Agreement was reached for seven new count locations, which will be supplemented by seven existing DfT counts. It was also outlined that the requirement for surveys on the M5 will be dependent on information on traffic generation from the Site
12 June 2024	Somerset Council	Updates regarding the Proposed Works, overview of decommissioning process and key assumptions. Early assessment findings presented. Queries raised in relation to cumulative assessment and consideration of the Gravity Local Development Order, and highway condition surveys of C182 road. Wih respect of the C182, the road is used by the Site, HPA and HPC. As part of the HPC development consent order, highway condition surveys are undertaken, and any maintenance required to this road is covered to a certain value by the S106 agreement attached to the DCO.
13 June 2024	National Highways	Updates regarding the Proposed Works, overview of decommissioning process and key assumptions. Early assessment findings presented. Queries raised by National Highways in relation to transport assumptions.
14 August 2024	National Highways	Provided an update on transport assumptions and anticipated trip generation. Queries raised in relation to baseline traffic associated with the operation of HPB and in relation to how committed developments have been considered, and requested further information should be provided in the ES. In response, **Section 16.5** of this chapter includes details on the operational workforce of HPB prior to defueling. **Chapter 21: Cumulative Effects Assessment** of the ES has also been updated to provide further information on how cumulative development have been considered in relation to traffic and transport.

16.5 Overall baseline

Hinkley Point B

16.5.1. As set out in **Chapter 2: The Decommissioning Process** of this ES, HPB became operational and began power generation in February 1976. As part of the next stage in the lifecycle of HPB, power generation ceased on 01 August 2022 and the station has entered into a period of defueling before the decommissioning works commence.

[15] Highways England was rebranded as National Highways 19 August 2021.

16.5.2. HPB has a 24-hours a day, seven days a week operational working pattern using shifts throughout operations, outage events and subsequent defueling. As set out in **Chapter 17: People and Communities**, HPB has provided employment across Somerset and Taunton and Sedgemoor and is one of the large employers.

Table 16-8 - HPB Workforce between 2020-2023

Year	EDF Staff	Contractors (including Agency Workers)
2020[16]	535	211
2021[17]	513	217
2022[18]	477	220
2023[19]	460	220

16.5.3. As of 31 December 2023, the workforce was 453 employees, who access the Site regularly (near daily).

16.5.4. In addition to staff movements, HGV movements, to support operational, maintenance and subsequent defueling activities, from between 2019 and 2023 ranged between 3600-4700 per year, averaging between 15-25 HGV movements per day, based on station records.

Road access

Local road network

16.5.5. The following sub-sections describe the key local roads and SRN that form part of the Study Area. The Study Area is depicted in **Figure 16.1** included in Volume II of this ES.

Wick Moor Drove

16.5.6. Wick Moor Drove is a single carriageway road north of Wick Lane. The section between Wick Lane and the HPC Campus roundabout is a 40mph road and has shared use tracks around the roundabout's perimeter, however, no footways nor cycle track are provided along the road south or north of the HPC Campus roundabout.

16.5.7. The section north of the HPC Campus roundabout is the access road to Hinkley Point A, B and C sites. This section of Wick Moor Drove is a private road and is subject to a 30mph speed limit. Access to this section of the road is controlled by gates. Footways are present along the eastern side of the unnamed roundabout and shared use cycle tracks are provided along the western side of the roundabout. The existing footways and shared use tracks end immediately after the roundabout, and there is no continuous infrastructure for non-motorised users between this unnamed roundabout

[16] EDF (2020) Station Director's Report for Site Stakeholder Group (14 October 2019 to 16 February 2020). Accessible at: Presentation1 (nrsssg.com) (Accessed August 2024).
[17] Holdford Parish Council (2021) Hinkley Point Site Stakeholder Group – summary of key points arising at the meeting held via zoon on Friday 25 June 2021. Accessible at: HINKLEY POINT SITE STAKEHOLDER GROUP (holford-pc.gov.uk) (Accessed August 2024).
[18] EDF (2022) Station Director's Site Stakeholder Group Report– June 2022. Accessible at: PowerPoint Presentation (nrsssg.com) (Accessed August 2024).
[19] EDF (2023) Station Director's Site Stakeholder Group Report -June 2023. Accessible at: https://nrsssg.com/wp-content/uploads/2023/06/Station-Directors-SSG-presentation-June-2023.pdf (Accessed August 2024).

and the HPC Campus roundabout, nor infrastructure for non-motorised users north of the unnamed roundabout.

16.5.8. Part of Kings Charles III Coast Path (WL23/95 and WL23/95) running in the vicinity of the Works Area has been temporarily diverted due ongoing HPC construction works, and it is rerouted across Wick Moor Drove.

Hinkley Point Road

16.5.9. Hinkley Point Road is a two-way single carriageway road that runs approximately for three miles westwards from its junction with Knaplock Lane. It is a 50mph road and no footways nor street lighting present for its entire length.

16.5.10. The road is rural in nature and fronted largely by agricultural land with a small number of residential properties that are set back from the road.

Withycombe Hill

16.5.11. Withycombe Hill runs for approximately one mile long between Brookside Road in Combwich and Knaplock Lane. It is a single carriageway road with a 50mph speed limit. There are no footways nor street lighting present for its entire length.

16.5.12. The road is also rural in nature and fronted predominantly by agricultural land and six residential properties near to Brookside have direct access to Withycombe Hill.

Rodway

16.5.13. Rodway runs approximately one mile connecting Combwich to the Cannington Bypass roundabout. This section of Rodway is a single carriageway 50mph road, and the speed limit reduces to 40mph as it approaches the roundabout.

16.5.14. This section of Rodway is rural in nature and a small number of residential properties have direct access to Rodway. This section of Roadway is also unlit. A continuous shared use track is present along its eastern side for its entire length from Brookside Road and the Cannington Bypass roundabout.

A39 Cannington Bypass

16.5.15. Cannington Bypass runs for one mile between the Cannington Bypass Roundabout and the High Street/Nether Stowey Road roundabout. It is a single carriageway 40mph road providing a more direct route to the M5, Bridgwater and Minehead via the A39. It has segregated cycle track on both sides of the road, and the road is not fronted by any properties.

A39 Link Road

16.5.16. The A39 Link Road is a two-way single carriageway located between Highstreet/Cannington bypass and Potter Way/A39 Main Road roundabouts that is located south of Cannington, forming part of the village bypass. There are no footpaths or street lighting present for its entire length. Access to the HPC Cannington Park and Ride is located on the A39 link road with the facility being located just to the north.

A39 New Road & A39 Main Road

16.5.17. The A39 is a single two-way carriageway that runs between the A39 Main Road and Sandford Corner roundabouts and is subject to various speed limits. The A39 includes a narrow footway on

eastern side of the carriageway, and it provides access to a number of local routes, including Blackmore Lane and Limestone Hill. The frontage along this section of the A39 is predominantly rural, with some retail units.

A39 Quantock Road

16.5.18. The A39 Quantock Road is a two-way single carriageway that runs between Sandford Corner and Whitegate Roundabout and is subject to various speed limits. A narrow footway is present on the eastern side of the carriageway. The frontage is predominantly rural, with some residential units present.

A39 Homberg Way

16.5.19. The A39 Homberg Way is a single two-way carriageway that widens at junctions to provide right-hand turning pockets into adjacent residential estates. The road features hatch markings on either side of the right-hand turning lanes and double yellow lines. The road is subject to a 30mph speed limit, and there are two signalised junctions along this section of the A39, and both junctions feature pedestrian crossings.

16.5.20. This highway link has good active travel facilities, with shared use track located on at least one side of the carriageway throughout its entire length. There are several uncontrolled pedestrian crossings present throughout this section of the A39, with street lighting provided.

Western Way

16.5.21. The A39 Homberg Way becomes Western Way towards The Drove. Western Way is a single two-way carriageway and surrounded by residential properties that are set back by fences, boundary walls or hedges from the carriageway.

Wylds Road

16.5.22. Western Way meets Wylds Road at a traffic signal junction that also connects to The Drove and East Quay. The northern route follows Wylds Road that runs in a northeasterly direction and joins Bristol Road at a priority T-junction. The area surrounding Wylds Road is predominantly industrial.

The Drove

16.5.23. The Drove is a single two-way carriageway that runs between the signalised crossroad at Wylds Road / Western Way and the A38 Bristol Road. The frontage is relatively industrial and includes access to various warehouse sites on the industrial estates. The Dorve is not proposed to be part of the northern route.

16.5.24. Pedestrian footpaths are present on both sides of the carriageway. The road is well lit and is subject to a speed limit of 30mph. The eastbound carriageway widens into two lanes on the approach to the Bristol Road junction, providing left and right-hand turning lanes.

Bristol Road

16.5.25. Bristol Road runs northwards from the T-junction with Wylds Road to provide a route to the A39 and a connection to the M5 at Junction 23. The first section from the T-junction is a single two-way carriageway then it becomes a dual carriageway as it approaches the Express Park Roundabout and continues as a dual carriageway until it joins the A39 at the Dunball Roundabout.

Strategic Road Network

16.5.26. The SRN comprises the routes of national strategic importance (motorways and trunk roads), which are operated and maintained by National Highways in the vicinity of the Site.

16.5.27. The relevant SRN are the A38 and A39. The A38 provides a strategic route between Bodmin in Cornwall and Mansfield in Nottinghamshire, passing through various towns and cities including Bridgwater, Bristol and Birmingham. For a large majority of its length, the A38 runs alongside the M5 as a single carriageway road. The Bristol Road section of the A38 provides a strategic route between Pawlett and Bridgwater.

16.5.28. The A39 is one of the longest routes in Southwest England, stretching from Bath in Somerset to Falmouth in Cornwall.

Cycling

16.5.29. There is no designated cycle infrastructure within the immediate vicinity of the site. However, an existing cycle track can be observed around the HPC roundabout. There are several locations within the Study Area where good cycling infrastructure can be observed such as Homberg Way.

16.5.30. National Cycle Route (NCR) 3 is the only national cycle route that is present within the Study Area which runs through Bridgwater and crosses the A38 Broadway.

Public Rights of Way (PRoW)

16.5.31. A desk-study has been undertaken to identify PRoW within the Study Area which may need to be closed or diverted (temporarily or permanently) to manage any potential conflict between non-motorised users and development generated traffic. The PRoW in the vicinity of the works area are shown on **Figure 16.5** included in Volume II of this ES.

16.5.32. Based on the current baseline, there are no PRoWs identified within vicinity of the Works Area which are likely to be impacted by the Proposed Works in relation to traffic and transport. However, in the wider Study Area, there are PRoW that intersect road links and King Charles III path Brean to Minehead National Trail (which includes WL23/95 and WL23/95) is temporarily diverted to facilitate the construction of HPC. Details on PRoW interacting with road links are described in

16.5.33. **Table** 16-9 below.

Table 16-9 - PRoW Network

PRoW in the Study Area	
WL 23/61 - Beginning from Wick Farm and runs northwards along Middle Moor Drove then along the eastern side of the HPB site	BW5/2 – this footway begins from the Bridgwater - Minehead County Road opposite Hawkers Lane and runs in a North easterly direction up the drive to the Grange crosses the A39.
WL23/71 - this is footway runs between FP No WL23/61 and WL23/70. It provides a temporary diversion for Wl23/95.	BW34/19 - beginning from Skimmerton Lane northeast of Greenway Farm and continues across fields in a south easterly direction to the North side of Quantock Road.
WL 23/95 (Kings Charles III Brean Down to Minehead) - located North of the site this path runs around the sea wall of the Hinkley Point	BW38/14 - starting from Quantock Road and runs Northeast to Borough boundary and on to Wembdon.

PRoW in the Study Area	
Power Station. The section of WL 23/95 north of the Hinkley Point C has been temporarily closed since May 2012.	
WL 23/70/1 - this is a restricted byway running adjacent to Wick Moor Drove which later diverts as byway No. 23/57	BW 34/1 – starting from Wembdon Rise crossing A39 Homberg Way, this footway follows Wares Lane continuing up to the Booth way.
WL23/59 - The path crosses Wick Moor Drove diagonally, extending in an east-west direction from West Brook to Stogursey Brook.	BW34/6 - starting from the junction of FP No 34/4 and 34/5 opposite the entrance to Church Farm, this runs in Eastern direction to Crow pill Rhyne intersecting A39 Homberg Way.
BW25/22 - starting from Bolham Bridge at Withycombe Hill and runs southwest to Moxhill Farm and alongside Moxhill Rhyne to the parish boundary. Continues to Beere Manor Farm as FP No.5/29.	BW38/3 - runs on the West Quay along riverbank of River Parrett from the Dock Cottages up to Linham Road crossing A39 Western Way.
BW 5/22 - starting Lovers Walk through High Street runs to Old Town Mill in a South-westerly direction over a stream and continues to Brooklands Farm and thence South westerly across a stream to Blackmore Lane crossing A39 Cannington Bypass.	BW38/2 - starting from FP No.34/4 runs from east end of drawbridge and in northern direction. Crossing railway lines following the riverbank.
BW 5/24 - beginning from Western end of Denman's Lane, old county road it runs by the Cannington Bridge in a southerly direction to Hawkers Lane crossing A39 Cannington Bypass where it joins FP No.25.	BW38/1 - The section of footpath runs from a point on the southern side of The Drove up to the Clink junction pass across A39 Drove.
BW5/25 – starting from New Road's main road, opposite FP No.2 in a westerly direction along Hawkers Lane and thence southerly to Blackmore Lane, Bradley Green	BW 38/5 - starting from Bristol Road and runs west to Riverbank adjacent to A38 Bristol Road.
BW38/16 - starting from the northern end of Oakfield Road and follows the western pavement of Danes borough Road in a northeast direction to junction with path No.12 up to A39 Quantock Road.	BW38/13 – starting from A 39 Quantock Road and runs northeast to Homberg Road.

Bus services

16.5.34. The nearest bus stop to the facility is Wayside Bus stop, Shurton which is approximately 3km from the Site and is served by route number 14 with frequency of two buses per day.

16.5.35. As part of the HPC construction works, to manage the construction workforce transport movements to the HPC site and reduce trips on the local highway network in the Somerset area, park and ride services have been implemented across four sites (Williton, Cannington, at Junction 23 of the M5, and Junction 24 of the M5)[20]. The facilities operate seven days per week to accommodate HPC construction project shift patterns. It is anticipated that these facilities will be removed at the end of the HPC construction.

Rail access

16.5.36. The nearest railway station is Bridgwater Station, situated approximately 10.7 miles southwest of the Site and approximately 25 minutes' drive. This station is serviced by Great Western Railway. The standard weekday service pattern includes one train in each direction every hour, with the majority of trains going to and from Cardiff Central and Penzance, however there are fewer services on Sundays.

16.5.37. HPC undertook a review of access to existing rail infrastructure which identified that whilst rail services operate from Bridgwater Station, there were few onward connections available to the HPC site. The review noted that the nearest point of connectivity to the existing rail network lies approximately 10km from the Site, and a new rail link was discounted on economic and environmental grounds. Therefore, rail did not form a significant element of the transport strategy for the movement of people or freight at HPC. These circumstances have not changed.

Existing highways network traffic flows

16.5.38. The assessment of likely significant effects requires a comparison to be made between the likely environmental conditions in the presence of the Proposed Works and the baseline situation.

16.5.39. Baseline traffic flow data of the links included in the assessment has been established using publicly available traffic counts published by the DfT for 2022 and ATC data from traffic survey undertook in 2022. These counts detail the annual average daily traffic (AADT) (24-hour), and the proportion of HGVs and other types of vehicles, at appropriate locations on each road within the Study Area. **Table 16-10** outlines the baseline flows for the year 2022.

16.5.40. As the Hinkley Point C (HPC) construction program began in 2017, the baseline data presented in **Table 16-10** below includes the traffic flows generated from HPC.

[20] EDF (2011) Hinkley Point C Development Consent Order Application Environmental Statement – Annex 7 Transport Assessment. Accessible at: Microsoft Word - HPC-NNBPEA-U0-000-REP-000109.doc (nationalarchives.gov.uk), (Accessed August 2024).

Table 16-10 - 2022 baseline traffic flow 12hr (two-way)

Road Link Name	Count ID	Light Vehicles	HGVs	Total
A39 Quantock Rock	ATC Link 4	73,224	9,823	83,046
A39 Homberg Way	ATC Link 5	90,657	15,588	106,245
A38 Bristol Road	ATC Link 6	95,963	19,491	115,454
A38 Taunton Road	ATC Link7	143,276	18,705	161,982
A38 Bristol Road North	DfT Counter 6403	26,350	2,068	28,418
A39 between Dunball Roundabout and Dunball Interchange	DfT Counter 6416	20,201	2,536	22,737
A38 Huntworth Lane	DfT Counter 57970	21,225	1,935	23,160

Existing accident records

16.5.41. Records of collision data have been obtained from Somerset County Council for the period between 1 April 2018 and 31 March 2023 and is included in **Appendix 16B**.

16.5.42. A review of PIC data has been undertaken. The impact of casualties differs according to the severity of the injuries sustained. Two casualty groups are differentiated as follows:

- serious: casualties who require hospital treatment and have lasting injuries, but who do not die within 30 days of an accident; and
- slight: where casualties have injuries that do not require hospital treatment, or, if they do, the effects of the injuries quickly subside.

16.5.43. A total of 141 collisions recorded within the Study Area, resulting in 255 casualties. **Table 16-11** provides a summary of collisions by the severity and year. The data shows there were in the range of 8 to 36 collisions per year over the five full years' worth of data.

Table 16-11 - Summary of accident record 2018-2023

Road section	Description	No of collisions per severity of casualty injury			Total	Average accident Rate per annum
		Slight	Serious	Fatal		
Northern Route						
Wick Moor Drove	Wick Moor Drove	2	0	0	2	0.4
Hinkley Point Road	Hinkley Point Road	1	0	2	3	0.6
Withycombe Hill	Withycombe Hill	2	0	2	4	0.8
Cannington Bypass	Cannington Bypass	1	0	1	2	0.4
A39	Link Road	2	0	0	2	0.4
A39	Main Road	1	1	0	2	0.4
A39	New Road	4	1	0	5	1.0
A39	Quantock Road	6	5	0	11	2.2
A39	Homberg Way	7	1	0	8	1.6
A39	Western Way between Quantock Way and The Drove	7	0	0	7	1.4
A39	The Drove	2	2	0	4	0.8
A38	Bristol Road between The Drove and Dunball Roundabout	25	4	0	29	5.8
A39	Between Dunball Roundabout and Dunball Interchange	2	2	0	4	0.8
Southern Route						
A39 North Street	Between Quantock Rd and Broadway	4	0	0	4	0.8
A38 Broadway	Between North St. and A38 Taunton Road	17	1	0	18	3.6

Road section	Description	No of collisions per severity of casualty injury			Total	Average accident Rate per annum
A38 Taunton Road	Taunton Road between Broadway and Huntworth Business Park/ Willstock Way Roundabout	32	8	0	40	8.0
A38	Between Huntworth Business Park/Willstock Way Roundabout and M5 J24	5	0	0	5	1.0
Total		120	25	5	150	

16.5.44. Wick Moor Drove, Hinkley Point Road and Withycombe Hill was agreed, with SCC and Highways England to be scoped out in the assessment. Of the remaining 141 collisions recorded within the Study Area, 22 collisions involved Non-motorised Users (NMU). Most of the collisions are caused by driver negligence and poor driving behaviour so it is concluded that the Study Area does not exhibit any highway issues which need to be targeted with specific casualty reduction measures as part of the development proposal. A breakdown of collision by casualties involved is illustrated in **Table 16-12.**The data shows that the greatest number of collisions within the Study Area occurred in 2023 with a total of 79 collisions that involved 64 vehicles. Two of the collisions recorded involved pedestrians and a further one involved a cyclist. No fatal collisions have been recorded within the Study Area over the five-year period.

Table 16-12 - Collisions by casualty

	Severity						
	Slight			Serious			Total
Year	Vehicle*	Ped	Cyclist	Vehicle*	Ped	Cyclist	
2018	20	1	1	4	0	0	26
2019	26	1	12	3	1	1	44
2020	20	3	1	10	0	0	34
2021	34	0	1	4	2	0	41
2022	18	3	3	6	1	0	31
2023	58	0	1	18	2	0	79
Total	176	8	19	45	6	1	255

*Vehicle includes number of vehicles involved in an accident.

16.5.45. **Table 16-13** summarises the primary contributory factor of the collisions, based on the information on the collisions and their contributary factors from the collision data obtained from SC. The most prevalent contributing factors reported as driver error or reaction and driver behaviour or inexperience.

Table 16-13 - Collision by Contributory factors

Contributing Factors	Attributes	Slight	Serious	Fatal	Total
Behaviour or Inexperience	Aggressive driving	0	0	0	0
	Careless / Reckless / In a hurry	11	5	0	16
Driver/Rider Error or Reaction	Failed to judge other persons path or speed	3	3	0	21
	Failed to look properly	37	43	0	43
	Loss of control	4	3	0	7
	Poor turn or manoeuvre	13	1	0	14
	Sudden braking	6	6	0	6
	Swerved	2	2	0	4
Impairment or Distraction	Fatigue	0	0	0	0
	Illness or disability, mental or physical	6	6	0	8
	Impaired by alcohol	4	4	0	6
	Impaired by drugs	0	0	0	0
Injudicious Action	Exceeding speed limit	6	6	0	6
	Following too close	2	4	0	6
Road Environment Contributed	Slippery Road (due to weather)	1	1	0	2
Special Codes	Other	2	2	0	2
Vision affected by	Dazzling sun	0	0	0	0
Total number of accidents		97	86	0	141

Baseline flow in Study Area

16.5.46. Baseline Annual Average Daily Traffic (AADT) flows for Year 2022 are presented in **Table 16-14**.

Table 16-14 - 2022 Baseline Flows (AADT-24 hr)

Road Link Name	Count ID	Light Vehicles	HGVs	Total
A39 Quantock Rock	ATC Link 4	90,651	12,161	102,811
A39 Homberg Way	ATC Link 5	112,233	19,298	131,531
A38 Bristol Road	ATC Link 6	118,803	24,130	142,932
A38 Taunton Road	ATC Link 7	177,376	23,157	200,533
A38 Bristol Road North	DfT Counter 6403	32,621	2,560	35,181
A39 between Dunball Roundabout and Dunball Interchange	DfT Counter 6416	25,009	3,140	28,148
A38 Huntworth Lane	DfT Counter 57970	26,277	2,396	28,672

Future baseline

Growth Factors

16.5.47. As the available traffic data is historic, growth rates have been applied to determine the future baseline for road traffic levels within the Study Area.

16.5.48. The Proposed Works are anticipated to commence in the year 2026, and the construction work of HPC is expected to be complete at the start of the next decade. Whilst the trip generation during the Preparations for Quiescence phase is expected to be the highest and the peak would occur in year 2034 (after HPC is operational), there would be some overlap of construction traffic for HPC and decommissioning traffic for the Proposed Works. On this basis, two future baseline year scenarios have been considered, Years of 2030 and 2034 within the assessment.

16.5.49. The growth rates for total vehicles have been derived from the DfT's TEMPro 8.0 software. Growth rates from TEMPro have been based on the Middle Layer Super Output Area (MSOA) in which the Proposed Works is located. The growth rates applied to the existing traffic flows in year 2022 are presented in **Table 16-15.**

16.5.50. TEMPro traffic growth factors have also been applied to obtain future year figures during Preparations for Quiescence phase. Average growth factors have been compiled using TEMPro 8.0 as summarised in **Table 16-15.** These growth factors were determined using the following criteria in TEMPro:

- Years: Base year 2022 to future years of 2030 and 2034;
- Area: West Somerset 004;

- Scenario: ‘Core’;
- Trip End: Origin / Destination; and
- Time Period: Average Weekday.

Table 16-15 - TEMPro Growth Factors (Daily) – Average Weekday

Years	Applied to	Growth Factor
2022 – 2030	ATCs and DfT Counters	1.0552
2022 – 2034	ATCs and DfT Counters	1.074

2030 Future Baseline Flows

16.5.51. The future baseline flows for 2030 are presented in **Table 16-16** below. These have been calculated by applying growth factor to 2022 baseline flows and include the expected construction traffic flows for HPC.

Table 16-16 - 2030 Future Baseline Flows

Road Link Name	Count ID	Light Vehicles	HGVs	Total
A39 Quantock Rock	ATC Link 4	77,266	10,365	87,631
A39 Homberg Way	ATC Link 5	95,661	16,448	112,109
A38 Bristol Road	ATC Link 6	101,261	20,567	121,827
A38 Taunton Road	ATC Link	151,185	19,738	170,923
A38 Bristol Road North	DfT Counter 6403	35,236	2,702	37,937
A39 between Dunball Roundabout and Dunball Interchange	DfT Counter 6416	26,713	3,313	30,026
A38 Huntworth Lane	DfT Counter 57970	28,052	2,528	30,580

HPC traffic

Construction traffic

16.5.52. HPC construction is expected to be completed at the start of the next decade. Assumptions on the HPC flows have been based on data available at the time of writing along the two fixed routes described in paragraph **16.3.6** are summarised in **Table 16-17.**

Table 16-17 - Assumed HPC Construction Daily Flows

Route	Light Vehicles (see Note)	Buses	HGVs (including AIL)	Total
Northern Route (Route 1)	90	324	112	526
Southern Route (Route 2)	8	297	35	340

Notes:

1.Traffic split of light vehicles from HPC has been calculated based on Census 2021 WF01BEW – location of usual residence and place of work (OA level) dataset. The dataset criteria are for place of work in West Somerset 004 middle layer super output area (MSOA) and usual residence of all 2011 census merged local authority districts.

2. The selected Census 2021 WF01BEW dataset described in Note 1 indicates existing commuting trips are split into 37% via M5 J23 (northern route), 3% via M5 J24 (southern route) and 60% via local roads.

3. The calculated HPC light vehicle flows using the split based upon Census 2021 WF01BEW dataset have been rounded up to the nearest even number.

Operational traffic

16.5.53. As stated in the HPC Transport Statement[21], during the operational phase, approximately 800 workers would be on the HPC site over the course of any weekday. A permanent car park at HPC development site will be provided for 505 spaces during normal operations. At the time of writing the Transport Assessment, it was expected that this would be restricted to 430 spaces for HPC staff, as some of the spaces would be required for HPB.

16.5.54. There is also a requirement for maintenance periods or 'outages' at HPC of one outage every 9 months at HPC (18 months per reactor unit). During outages, a second car park, with a capacity of 508 spaces was proposed, for HPC outages staff, and a further 180 spaces is available at the car park east of the HPC site to replace the overflow car park (which at the time of its writing was proposed to be available exclusively to HPB staff and disabled visitors to HPC.

16.5.55. **Table 16-18** below summarises assumed HPC operational daily flow during a planned outage which represents the highest number of staff on site.

Table 16-18 - Assumed HPC Operational Daily Flows (during outage) on the Proposed Works traffic route

Route	Light Vehicles (see Note)	Buses (see Note 4)	HGVs (including AIL)	Total
Northern Route (Route 1)	347	0	0	347
Southern Route (Route 2)	28	0	0	28

[21] HPC Ltd. 2011. Transport Assessment. Accessible at: Microsoft Word - HPC-NNBPEA-U0-000-REP-000109.doc (nationalarchives.gov.uk). Accessed April 2024.

Notes:

1.Traffic split of light vehicles from HPC has been calculated based on Census 2021 WF01BEW – location of usual residence and place of work (OA level) dataset. The dataset criteria are for place of work in West Somerset 004 middle layer super output area (MSOA) and usual residence of all 2011 census merged local authority districts.

2. The selected Census 2021 WF01BEW dataset described in Note 1 indicates existing commuting trips are split into 37% via M5 J23 (northern route), 3% via M5 J24 (southern route) and 60% via local roads.

3. The calculated HPC light vehicle flows using the split based upon Census 2021 WF01BEW dataset have been rounded up to the nearest even number.

4. Assume no additional bus services during the operational phase.

2034 Future Baseline Flows

16.5.56. The HPC construction daily flows have been deducted from 2022 baseline flows prior to applying the 2022-2034 growth factor to calculate the 2034 future baseline flows without HPC construction traffic. **Table 16-19** shows 2034 future baseline flows that been calculated by adding HPC operational flows on to the 2034 future baseline flows without HPC construction traffic.

Table 16-19 - 2034 Future Baseline Daily Flows

		2034 flows without HPC construction flows			2034 flows without HPC construction flows + with HPC operational flows		
Road Link Name	**Count ID**	**Light Vehicles**	**HGVs**	**Total**	**Light Vehicles**	**HGVs**	**Total**
A39 Quantock Rock	ATC Link 4	76,944	10,328	87,272	76,972	10,328	87,300
A39 Homberg Way	ATC Link 5	95,224	16,330	111,554	97,571	16,330	111,901
A38 Bristol Road	ATC Link 6	100,824	20,448	121,272	101,171	20,448	121,619
A38 Taunton Road	ATC Link	150,863	19,701	170,564	150,891	19,701	170,592
A38 Bristol Road North	DfT Counter 6403	34,799	2,583	34,799	35,146	2,583	37,729
A39 between Dunball Roundabout and Dunball Interchange	DfT Counter 6416	26,276	3,195	29,471	26,623	3,195	29,818
A38 Huntworth Lane	DfT Counter 57970	27,730	2,491	30,221	27,758	2,491	30,249

16.5.57. The impact of the traffic has been assessed in two scenarios as follows (see **Section 16.7**):

- 2030/2034 – No Proposed Works – this includes the future baseline only.
- 2030/2034 – with Proposed Works -this includes the future baseline and Proposed Works flows (HPB)

16.5.58. Both scenarios have been presented in **Table 16-29** and **Table 16-30** in **Section 16.10.**

16.6 Embedded environmental measures

16.6.1. Environmental measures have been embedded into the Proposed Decommissioning work; these are captured within the Outline CTMP submitted within **Appendix 16A**.

16.6.2. **Table 16-20** outlines the embedded measures relevant to traffic and transport.

Table 16-20 - Summary of Embedded Environmental Measures

Embedded Measure	Compliance Mechanism	Embedded or good practice measure
An outline CTMP has been developed which recognises the requirement to manage decommissioning traffic movements (see **Appendix 16A**).	CTMP	Embedded measure

16.6.3. The following measures have been outlined within the Draft CTMP, noting that a detailed CTMP will be finalised by the Site Licensee prior to the commencement of the Proposed Works. Key elements of the outline CTMP include:

- Approved decommissioning vehicle routes to the HPB Site will be identified and protocols put in place to ensure that HGV drivers adhere to these routes. The Site Licensee however needs to ensure that the road works register is checked when planning routes and drivers are informed of any the diversion route;
- All contractors will be provided with a Site Induction Pack containing information on delivery routes and any restrictions on routing;
- All contractors will be required to give details of proposed timing of material or equipment deliveries to the Site;
- A CTMP and compliance monitoring therein will be included within all trade contractor tender enquiries to ensure early understanding and acceptance/compliance with the rules that would be enforced on this project;
- Roads will be maintained free from debris where required, and road sweepers deployed as required; and
- Vehicles within the Site and Works Area will continue to use existing roads, with only limited transit across unmade ground. Should trackout become more likely, the use of a wheel wash facility will be installed on-site in order to reduce trackout of mud and debris onto the local road network.

16.7 Assessment methodology

16.7.1. The generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this traffic and transport chapter, the following sections set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of the traffic and transport assessment in this ES.

General approach

16.7.2. To assess the impact of its peak, the likely percentage increase in traffic is determined by comparing estimates of traffic generated by the Proposed Works with future predicted baseline traffic flows for the roads within the Study Area.

16.7.3. The following screening rules are suggested in Chapter 2 of the EATM[12] guidance and will be used to define the assessment:

- "*Rule 1: include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%); and*
- Rule 2: include highway links of high sensitivity where traffic flows are predicted to increase by 10% or more."

16.7.4. It should be noted that EATM recognises that it is generally accepted that the day-to-day variation of traffic on a road is frequently at least + or -10%. The projected changes in traffic of less than 10% should be assumed to create no discernible environmental impact. Where predicted traffic flow increases due to the Proposed Works are below 10%, the changes in traffic flow are not be assessed. Consideration on the duration of the impact within the assessment will also be required and the assessed traffic movement volumes should be a worst-case scenario.

16.7.5. As noted in Section 16.4, the EIA Scoping Report was submitted to the ONR on 07 December 2022, the GEART was superseded (in July 2023); the assessment has been undertaken in accordance with the updated guidelines.

Environmental effects

16.7.6. The EATM[12] sets out the following environmental effects that should be considered:

Severance of communities

16.7.7. Severance is the perceived division that can occur within a community when it becomes separated by transport infrastructure. The EATM states that when assessing severance, the assessor should:

- consider the highway characteristics and features;
- consider the traffic flow and composition;
- define the facilities to which access is potentially impaired;
- define the facility catchment areas from which users may be drawn; and
- estimate the populations within those areas - both in total, and vulnerable groups (by which severance may be more impactful).

16.7.8. There is no predictive formula which gives simple relationships between traffic factors and levels of severance. EATM states that while not prescriptive, the thresholds for changes in traffic flow of 30%, 60% and 90% can be regarded as a starting point to estimate corresponding 'slight', 'moderate' and 'substantial' changes in severance and the assessment should give regard to specific local conditions. In general, marginal (slight) changes in traffic flow are, by themselves, unlikely to create or remove severance.

Road vehicle driver and passenger delay

16.7.9. EATM states that delays to traffic (unrelated to a development or proposed works) are only likely to be significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system. The capacity of a road or a particular junction can be determined by estimating vehicle time and delay through the junction as well as junction operational capacity to determine the sensitivity to development traffic.

16.7.10. Delay might be found more commonly at site entrances, on the highways passing the development sites where parked cars are present, at key intersections along a route, and at side roads where the ability to find gaps in traffic may be reduced, thereby lengthening delays.

Non-motorised user delay

16.7.11. The EATM[12] states that non-motorised user amenity is broadly defined as the relative pleasantness of a journey, and is considered to be affected by traffic flow, composition, and separation from traffic, which includes consideration to exposure to noise and air pollution.

16.7.12. EATM notes that changes in pedestrian, cyclist and equestrian amenity may be considered significant where the traffic flow is halved or doubled, with the former leading to a positive effect and the latter a negative effect.

Fear and intimidation on and by road users

16.7.13. The EATM notes that the extent of fear and intimidation is dependent on:

- the total volume of traffic;
- the heavy vehicle composition;
- the speed these vehicles are passing; and
- the proximity of traffic to people – and/or the feeling of the inherent lack of protection created by factors such as a narrow pavement median, a narrow path or a constraint (such as a wall or fence) preventing people stepping further away from moving vehicles.

16.7.14. The EATM identifies that the assessment should be defined by the degree of hazards to pedestrians by average traffic flow over an 18-hour heavy vehicle flow and average speed over an 18-hour day in miles per hour.

16.7.15. A weighting system is applied to the guidelines to assign scores for each highway link of consideration.

16.7.16. **Table 16-21** provides an example of a scoring system that can be adapted to reflect local conditions.

Table 16-21 - Fear and intimidation degree of hazard

Average traffic flow 18-hour day - all vehicles/hour 2-way (a)	Total 18-hour heavy vehicle flow (b)	Average vehicle speed (c)	Degree of Hazard score
+1,800	+3,000	->40	30
1,200-1,800	2,000-3,000	30-40	20
600-1,200	1,000-2,000	20-30	10
<600	<1,000	<20	0

16.7.17. The total score from all three elements is combined to provide a 'level' of fear and intimidation for all three elements. **Table 16-22** provides an example.

Table 16-22 - Level of fear and intimidation

Level of Fear and Intimidation	Total hazard score (a)+(b)+(c)
Extreme	71+
Great	41-70
Moderate	21-40
Small	0-20

16.7.18. The magnitude of impact is approximated with reference to the changes in the level of fear and intimidation from baseline conditions, see **Table 16-23**.

Table 16-23 - Fear and intimidation magnitude of impact

Magnitude of Impact	Change in step/traffic flows (AADT) from Baseline conditions
High	Two step changes in level
Medium	One step change in level, but with: <400 vehicle (veh) increase in average 18hr AADT two-way all vehicle flow; and/or <500 Heavy Vehicles (HV) increase in total 18hr HV flow.
Low	One step change in level, with: <400 veh increase in average 18hr AADT two-way all vehicle flow; and/or <500 HV increase in total 18hr HV flow.
Negligible	No change in step changes

16.7.19. EATM notes that special consideration should be given to areas where there are likely to be particular problems, such as high-speed sections of road, locations of turning points and accesses, and the inherent lack of protection preventing people stepping further away from moving vehicles. In addition, locations where people may be unfamiliar with the locale and the movement of hazardous/large loads which will heighten people's perception of fear and intimidation. Consideration should also be given to areas frequented by school children, the elderly and other vulnerable groups.

Road user and pedestrian safety

16.7.20. This is informed by a review of existing collision patterns and trends based upon the existing PIC records and the forecast increase in traffic.

16.7.21. The EATM guidance[12] suggests in addition to the calculation of collision rates and collision analysis of STATS19, personal injury road traffic accidents data to identify any emerging patterns or factors that could be exacerbated by the increased traffic or movement. The 'Safe System' approach should be considered where proportionally appropriate. The approach is broadly as follows:

- Identify the Study Area using historic crash data;
- Undertake evidence-led, objective modelling techniques to establish a baseline road safety level for the roads within the Study Area on which the impact thresholds are exceeded in relation to either non-motorised users or motorised user traffic. This analysis can be carried out using tools such as the iRAP Star[22] Ratings protocols or similar tools produced by individual highways authorities; and
- Assess the effects of additional development traffic for all users (including vulnerable groups[22]), across the whole width of the highway corridor. This model should also assess the effect of any changes to the baseline road network, such as the provision of access junctions.

Road safety audit

16.7.22. The EATM[12] states that Road Safety Audits in accordance with GG119 – Road Safety Audit DMRB[23] should be undertaken for any proposed engineering changes in the adopted highway prior to submission.

Hazardous loads/large loads

16.7.23. The traffic and movement assessment needs to estimate number and composition of specialist loads which are subject to The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009 (as amended).

16.7.24. It also recommends including transport related hazard and accident assessment in a wider environmental assessment that contains a project-wide accident and disaster assessment.

[22] iRAP (2021). For *a world free of high-risk roads* (Online) Available at: https://irap.org/ (Accessed August 2024). iRAP star rating is measuring the level of safety across more than 50 attributes that reflect the risk for its road users (vehicle occupants, motorcyclists, cyclists and pedestrians. 1-Star roads have the higher risk and 5-Star roads the lowest risk.

[23] Highways England (2020*). Design Manual for Roads and Bridges, GG 119 – Road Safety Audit*. (Online) Available at: https://www.standardsforhighways.co.uk/tses/attachments/710d4c33-0032-4dfb-8303-17aff1ce804b?inline=true (Accessed August 2024).

Other effects

16.7.25. The IEMA Guidance also refers to air quality, noise and vibration, landscape and visual, biodiversity, cultural heritage and climate resilience, adaptation and GHGs, which are assessed in their respective ES chapters**.**

Receptor sensitivity

16.7.26. As set out in EATM, the impact of traffic is dependent upon a wide range of factors which include the volume of traffic, traffic speeds and operational characteristics and traffic composition (such percentage of HGVs) and future cumulative development traffic. The perception of changes in traffic varies according to factors such as:

- existing traffic levels;
- the location of traffic movements;
- the time of day;
- temporal and seasonal variation of traffic;
- design and layout of the road and pavement;
- crossing points;
- landscape/townscape character, designated status, land use activities adjacent to the route; and
- ambient conditions of adjacent land-uses.

16.7.27. Each highway link included in the assessment has been assigned a sensitivity in accordance with EATM based on professional judgement.

16.7.28. This is based on the proximity of sensitive receptors to the highway link and the highway environment. **Table 16-24** summarises the rationale used to determine the sensitivity against the corresponding receptors as part of the assessment as contained in EATM. Professional judgement is also used to determine the sensitivity of the receptor.

Table 16-24 - Receptor Sensitivity

	Sensitivity			
Receptor	**High**	**Medium**	**Low**	**Negligible**
Users of Roads	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of

Receptor	Sensitivity			
	High	Medium	Low	Negligible
				accommodating Abnormal Loads.
Users/Residents of Locations	Where a location is a large rural settlement containing a high number of community and public services and facilities.	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.	Where a location is a small rural settlement, few community or public facilities or services.	Where a location includes individual dwellings or scattered settlements with no facilities.

16.7.29. Sensitivity judged as 'High' or 'Medium' results in Rule 2 (sensitive areas where traffic flows are predicted to increase by 10% or more) being considered for that link. Sensitivity judged as 'Low' or 'Negligible' results in Rule 1 being considered for that link where traffic flows are predicted to increase by more than 30% or where the number of HGVs is predicted to increase by more than 30%.

Magnitude of change

16.7.30. EATM[12] recognises that professional judgement should be used as part of the assessment and states the following:

"There are no simple rules or formulae that define appropriate assessment thresholds and therefore there is a need for interpretation and judgement on the part of the competent traffic and movement expert, backed up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing an impact and the sensitivity of those people, as well as the assessment of the damage to various natural or cultural resources." (Paragraph 3.12).

16.7.31. Based on Rule 1 and Rule 2 and the sensitivity of the receptors, **Table 16-25** shows the magnitude of change applied to the environmental effects, to identify levels of significance. The indicators to assess the magnitude of change are based on advice included within EATM and on professional judgement.

Table 16-25 - Magnitude of change

Transport effect	Magnitude of change			
	High	Medium	Low	Negligible
Severance	Change in total traffic or HGV flows over 91%.	Change in total traffic or HGV flow of 61-90%.	Change in total traffic or HGV flows of 31-60%.	Change in total traffic or HGV flows of less than 30%.
	Context should also be considered including population and facilities impacts. EATM states caution should be applied with applying these thresholds to highway links with low baseline flows.			

Transport effect	Magnitude of change			
	High	Medium	Low	Negligible
Driver delay	High increase in queuing at junctions and/or congestion on road links.	Medium increase in queuing at junctions and/or congestion on road links.	Low increase in queueing at junctions and/or congestion on road links.	Low or no increase in queuing at junctions and/or congestion on road links.
Non-Motorised users	A halving or doubling of traffic flow (of HGV flow) can be used as a broad threshold when considered in the local context and applied with caution. Assignment based on a variety of factors including general level of pedestrian activity, visibility, and physical conditions such as traffic flow, traffic composition, crossing points and pavement width/separation from traffic.			
Non-motorised user delay	Assessed based on pedestrian delay experienced when crossing highways links considering a range of factors including crossing type, pedestrian flows, traffic levels, visibility and general highway condition.			
Fear and Intimidation	Assigned based on the levels scoring systems provided in EATM (which is dependent on 18hr average traffic flow; 18hr average HGV traffic flow and vehicle speed) extreme 71+; great (41-70); moderate (21-40) and small (0-20).			
	Two step change in level score of fear and intimidation	change in level score of fear and intimidation and >400 average 18hr vehicle increase or >500 HGV 18hr vehicle increase.	One step change in level score of fear and intimidation and <400 average 18hr vehicle increase or <500 HGV 18hr vehicle increase.	No change to step in level score of fear and intimidation
Road safety	Assignment informed by a review of existing collision patterns and trends based upon the existing personal injury accident records and the forecast increase in traffic.			
Hazardous/Large Loads	Assigned based on the nature of the load and number of trips and the result of hazard and accident assessment.			

Significance criteria

16.7.32. The classification of a likely Traffic and Transport effect is derived by considering the sensitivity of the receptor (derived from **Table 16-24**) against the magnitude of change (derived from **Table 16-25**) as defined in **Table 16-26** below. The shading indicates those significance ratings that are deemed to be 'significant' effects.

Table 16-26 - Significance evaluation matrix

Nature of Impact (Magnitude / Probability / Reversibility etc)	Receptor sensitivity			
	High	**Medium**	**Low**	**Negligible**
High	Major (Significant)	Major (Significant)	Moderate (Significant)	Negligible (Not Significant)
Medium	Major (Significant)	Moderate (Significant)	Minor (Not Significant)	Negligible (Not Significant)
Low	Moderate (Significant)	Minor (Not Significant)	Minor (Not Significant)	Negligible (Not Significant)
Negligible	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)	Negligible (Not Significant)

16.7.33. Major and Moderate effects are considered to be Significant, whilst Minor and Negligible effects are considered to be Not Significant.

Specific definition used in the assessment

16.7.34. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999[24] (EIADR) (as amended) recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identifies environmental resources that warrant investigation as those that are likely to be significantly affected by the Proposed Works.

16.7.35. The EIADR do not define significance and it will be necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development is most assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by a development.

16.7.36. EATM identifies receptors that may be affected by additional traffic because of the Proposed Works which can be grouped into:

- Users of the roads which are also proposed to be utilised by development traffic; and
- Land uses and environmental resources fronting those roads, including the relevant occupiers and users.

16.7.37. Sensitivity is assigned to the road links based on road characteristics and nature of the receptors.

[24] UK Government (1999). *Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)* (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

16.8 Assumptions and limitations

16.8.1. The assessment undertaken in this chapter is based on the information available at the time of assessment. The assumptions and limitations associated with this assessment, include:

- HPC is expected to begin generation at the end of the decade, however some construction activity may remain at this time including works on the second reactor unit and landscaping. On this basis, HPC trips associated with the construction phase are assumed to still be required in the 2030 future baseline year. However, for the 2034 flow (the peak traffic year of the Proposed Works), the HPC construction trips have been removed but the operational and monitoring and maintenance trips (referred to as outage), which are likely to occur every 9 months at HPC, have been included within the 2034 scenario.
- DfT counters provide estimated flows only on the selected links.
- **Section 16-5** of this chapter provides details on the HPB workforce during operation of the station and since entering defueling. As described, in **Chapter 17: People and Communities** sets out assumptions for changes in the HPB workforce that will undertake the Proposed Works. Whilst staff will gradually decrease during the Preparations for Quiescence phase, for the purposes of the assessment, to ensure a reasonable worst case has been assessed in relation to traffic movements, it is assumed the workforce (and in relation to the number of cars/LGVs) will remain constant from the start of this phase to the end as per the operation of the power station which is included in the baseline traffic numbers, plus an additional allowance during the Proposed Works for specialist contractors /LGVs.
- Whilst HPB activities currently generate a number of HGV movements as part of the current defueling operations on the Site it is expected that the existing HGV movements would decrease during the Preparations for Quiescence phase. However, as the Proposed Works will generate new activities, HGV movements are therefore additional to the HPB baseline (as set out in **Section 16.5**) to represent a reasonable worst-case assessment and demonstrate the impact of these movements on the highway network.

16.9 Scope of the Assessment

16.9.1. All transportation of materials, plant and equipment required for the Proposed Works will be via the road network. Two highway routes for materials to and from the Site have been identified (see paragraph 16.3.6). Neither transportation of materials via rail nor by water are considered viable. Therefore, rail and marine transport modes has not been considered in this ES.

16.9.2. The northern route (Route 1 via M5 Junction 23) is the preferred construction route.

Trip generation

16.9.3. The trips during the Preparations for Quiescence phase are generated from:

- staff trips;
- the removal of conventional waste from the Site created by deplanting and demolition activities;
- the removal of radioactive wastes generated from deplanting activities within the Radiation Controlled Areas on site;

- the filling of voids created during deplanting and demolition activities with off-site materials should it not be practicable to manage open voids throughout the Quiescence phase or use onsite materials to fill voids; and
- the importation of plant, equipment and materials to site to undertake decommissioning activities and modify the reactor building into the Safestore structure.

16.9.4. This trip generation data for the Preparations for Quiescence phase assumed that the Safestore will house multiple elements of plant including the two reactors, Active Effluent Treatment Plant (AETP), boilers and High Activity Debris vault (HADVs) throughout the Quiescence phase.

16.9.5. **Table 16-27** below summarises the additional trip generation during the decommissioning phase on top of the baseline traffic flows (the net change in trip movements).

Table 16-27 - Trip generation (additional to baseline traffic flows)

Decommissioning phase	Activity	Timescale	Max HGVs (vehs/day – two ways)	Max Car/LGV traffic (vehs/ day – two ways)
Preparations for Quiescence phase	Deplanting and deconstruction, Active area deplanting, Waste processing and packaging, void filling and Safestore construction.	Y1- Y13	<30	100
Quiescence phase		Y13 - Y81	-	
Final Site Clearance phase	Waste management centre construction/operation and decommissioning Retrieval of interim level waste from debris vaults Reactor dismantling Site remediation for future re-use	Y82 – Y96	<29	<99

16.9.6. The scope of the assessment of traffic and transport is consistent with the period over which the Proposed Works will be undertaken (see **Chapter 2: The Decommissioning Process**).

16.9.7. The assessment focuses on the traffic generation during the Preparations for Quiescence phase, Quiescence phase and Final Site Clerance and a worst-case will be identified. This is in accordance with the assessment approach suggested in EATM.

16.9.8. "*environmental change will generally be when the project traffic is at the largest proportion of the total flow. It is therefore recommended that the environmental assessment should be undertaken at the construction/decommissioning phase, year of opening of the project or the first full year of its opening.*"

16.9.9. It is expected that a worst-case with respect to traffic flows will be during the Preparations for Quiescence phase during times where there is potential for an overlap in deconstruction and waste management activities and the infilling of voids using off-site material.

16.10 Assessment of traffic and transport effects

16.10.1. This section provides an assessment of the likely significant environmental effects arising from the predicted traffic generated by the Proposed Works.

16.10.2. Sensitivity of highway links Receptors are the users or beneficiaries of highways network assets and facilities such as pedestrian, cyclists, equestrian and drivers who travel within the vicinity of the Proposed Works. The assessment approach set out in IEMA identifies the following groups and special interest groups that may be affected by a development:

- people at home;
- people at work;
- sensitive groups including children, elderly and disabled;
- sensitive locations such as hospitals, churches, schools and historical buildings; pedestrians;
- cyclists;
- open spaces, recreational areas and shopping areas;
- sites of ecological and nature conservation value; and
- sites of tourist/visitor attractions.

16.10.3. **Table 16-28** identifies the receptors of relevance along the highway routes within the Study Area. In addition, **Table 16-28** identifies the sensitivity of the relevant highway links (in vicinity of the count point and general nature of highway link as a whole) and the EATM Rule that applies.

Table 16-28 - Receptors Subject to Potential Effects

Receptor	Reason for Consideration	Rule 1/2	Receptor Sensitivity
Quantock Road (link 4)	This road which link the A38 and A39 are predominantly through residential areas, interspersed by areas of retail frontage. Pedestrian footway is present along this route.	Rule 2	Medium
A39 Homberg Way (link 5)	A39 is used as a bus route. It serves a number of residential sites, Wembdon Village Hall, industrial units and a veterinary hospital.	Rule 2	Medium

Receptor	Reason for Consideration	Rule 1/2	Receptor Sensitivity
A38 Bristol Road (link 6)	The A38 Bristol Road, north of the Drove, is a single and then dual carriageway road. The frontages on both sides of the road are a mix of residential and commercial properties.	Rule 2	Medium
A38 Taunton Road (link 7)	A38 Taunton Road runs through areas with residential properties, a dental surgery and a medical centre. It is also used as a bus route.	Rule 2	Medium
A38 Bristol Road North (link 11)	Dual carriageway through urban area. Frontages include some residential units, retail and light industrial, some of which gain direct access from the A38.	Rule 1	Low
A39 between Dunball roundabout and Dunball Interchange (link 12)	Dual carriageway with very few commercial developments, serves as a major corridor for connecting to M5 at junction 23.	Rule 1	Low
A38 Huntworth Lane (link 13)	Dual carriageway with no developments on both sides of the road, connects A38 to M5 at junction 24.	Rule 1	Low

Likely Significant Effects

16.10.4. **Table 16-29** summarises transport receptors and relevant environmental effects that have the potential to be significant resulted from the increased traffic generated by the Proposed Work.

Table 16-29 - Likely significant traffic and transport effects

Activity	Effects	Receptor
Traffic generated by the Proposed Works	Environmental effects identified in EATM will be considered: Severance; Driver delay; Non-motorised amenity; Non-motorised user delay; Fear and intimidation on and by road users; Road users and safety; and Hazardous/large loads	Transport receptors to be defined based on: Users of the roads; and Land uses and environmental resources fronting those roads, including the relevant occupiers and users

Trip Generation

16.10.5. The Preparations for Quiescence phase is assumed to be the worst-case phase for traffic generation during the Proposed Works. Average traffic flow data were used to establish the trips associated with the Proposed Works using a first principle approach based upon the likely volumes of construction materials, resources and components.

16.10.6. The trip estimates have been assigned to the proposed decommissioning programme to allow the identification of the peak of traffic associated with the Proposed Works to be established. The decommissioning programme is set out in **Chapter 2: The Decommissioning Process** of this ES. The traffic generated by the existing staff trips has already been accounted for in the 2022 traffic counts, (which coincides with the end of generation and start of defueling).

16.10.7. The peak of Proposed Works traffic activity was identified as being in year 2034. The traffic associated with this year was then assigned to the Study Area network using the distribution of traffic based on Route 1.

16.10.8. The peak traffic flows associated with the Proposed Works' construction phase results in an average of 130 movements per day (65 inbound trips and 65 outbound trips), of which 100 comprises light vehicles (50 inbound and 50 outbound) and 30 by HGV (15 inbound and 15 outbound) which is additional to the staff trips generated by the Proposed Works. Following the distribution and assignment of traffic flows to the Study Area network, the resultant daily traffic flows during the peak of construction are summarised in **Table 16-30**.

Table 16-30 - Forecast two-way daily traffic flows with the Proposed Works (2030)

Link No	Link / Receptor	2030 Future Baseline		Proposed Works Traffic (see notes)		2030 + Proposed Works Traffic		% change		Further Assessment Requirement
		Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	
4	A39 Quantock Rock	87,631	10,365	130	30	87,759	10,393	0.1%	0.3%	Below 10% - no further assessment required
5	A39 Homberg Way	112,109	16,448	130	30	112,238	16,476	0.1%	0.2%	Below 10% - no further assessment required
6	A38 Bristol Road	121,872	20,567	130	30	121,955	20,595	0.1%	0.1%	Below 10% - no further assessment required
7	A38 Taunton Road	170,923	19,738	130	30	171,051	19,766	0.1%	0.1%	Below 10% - no further assessment required
11	A38 Bristol Road	37,937	2,702	130	30	38,066	2,730	0.3%	1.0%	Below 30% - no further assessment required
12	A39 between Dunball roundabout and Dunball Interchange	30,026	3,313	130	30	30,154	3,341	0.4%	0.9%	Below 30% - no further assessment required
13	A38 Huntworth Lane	30,580	2,528	130	30	30,708	2,556	0.4%	1.1%	Below 30% - no further assessment required

Notes:

1. The Northern Route (Link 11 – A38 Bristol Road and Link 12 – A39 between Dunball roundabout and Dunball Interchange) has been assessed with 100% of the Proposed Works traffic. To provide robustness, the Southern Route (Link 13 – A38 Huntworth Lane) has also been assessed with 100% of Proposed Works traffic.

Table 16-31 - Forecast two-way daily traffic flows with the Proposed Works (2034)

Link No	Link / Receptor	2034 Future Baseline		Proposed Works Traffic (see notes)		2034+ Proposed Works Traffic		% change		Further Assessment Requirement
		Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	Total Vehicles	HGVs	
4	A39 Quantock Rock	87,300	10,328	130	30	87,429	10,358	0.1%	0.3%	Below 10% - no further assessment required
5	A39 Homberg Way	111,901	16,330	130	30	112,031	16,360	0.1%	0.2%	Below 10% - no further assessment required
6	A38 Bristol Road	121,619	20,448	130	30	121,749	20,478	0.1%	0.1%	Below 10% - no further assessment required
7	A38 Taunton Road	170,592	19,701	130	30	170,722	19,731	0.1%	0.2%	Below 10% - no further assessment required
11	A38 Bristol Road	37,729	2,583	130	30	37,859	2,613	0.3%	1.1%	Below 30% - no further assessment required
12	A39 between Dunball roundabout and Dunball Interchange	29,818	3,195	130	30	29,948	3,224	0.4%	0.9%	Below 30% - no further assessment required
13	A38 Huntworth Lane	30,249	2,491	130	30	30,379	2,520	0.4%	1.2%	Below 30% - no further assessment required

Notes:

1. The Northern Route (Link 11 – A38 Bristol Road and Link 12 – A39 between Dunball roundabout and Dunball Interchange) has been assessed with 100% of the Proposed Works traffic. To provide robustness, the Southern Route (Link 13 – A38 Huntworth Lane) has also been assessed with 100% of Proposed Works traffic.

16.10.9. As shown in **Table 16-27** and **Table 16-28**, traffic flow changes on the local roads due to the Proposed Works traffic are below 10% which is within the allowance for daily variation of traffic flows for all roads and therefore further assessments are not required.

16.10.10. EATM however advises that the Rule 1 and Rule 2 'criteria' process should not be applied to assessments of air quality, noise, road safety and driver delay. For these impacts, a separate study area and assessment criteria should be agreed with the relevant stakeholders. However, these criteria have not been applied to air quality, noise, road safety, and driver delay, based on professional judgment.

16.11 Detailed assessment of effects

Road safety

16.11.1. The DfT (2023) reported road casualties for Great Britain 2022 presented in RAS030225 for 2013 to 2022 and includes the national accident numbers per billion vehicle kms by road classification. **Table 16-32** summarises the national accident rate per million vehicle kms by road classification for 2018 to 2022.

Table 16-32 - Accident rate per million vehicle kilometres by road type

Road Type	2018	2019	2020	2021	2022	Average
Urban A-Road	0.43	0.42	0.42	0.42	0.30	0.43
Rural A-Road	0.12	0.11	0.11	0.11	0.11	0.12

Source: DfT statistics (2023) RAS0302

16.11.2. The collision data for the most recent five-year period provided by Somerset Council was analysed to identify any collision cluster sites and trends, to allow the identification of existing problems which may be exacerbated by the traffic associated with the Proposed Works, that could influence or impact the highway scheme.

16.11.3. Cluster sites were identified using collision plot maps to identify concentrations of five or more collisions at any location within the Study Area, whilst ensuring that all accidents within the Study Area in question were captured.

16.11.4. Typically, collision clusters occur at, and on the approach to junctions. The number and spread of collisions that have been recorded during the five-year period confirms that the collisions within the Study Area tend to be in clusters on approach to a number of junction / accesses, along the local highway network and SRN. A number of collisions also appear to have occurred due to slow moving traffic along the network and drivers failing to adapt to changing circumstances in appropriate time.

A39 Cannington Bypass

16.11.5. A total of five PICs were recorded at this location over the five-year period, resulting in an annual accident rate of 1.0. All five incidents were slight, and none was serious or fatal in severity.

[25] DfT statistics (2023) *Road type RAS0302.* (Online) Available at: https://www.gov.uk/government/statistical-data-sets/reported-road-accidents-vehicles-and-casualties-tables-for-great-britain#road-type-ras03 (Accessed April 2024).

16.11.6. Given the length of the road section (approximately 1.3 km) it is prudent to compare the accident rate of the road section with average national accident rate for the road type. Based on the count point along this road (ATC 2) as identified in Figure 16.3, the Annual Personal Injury Accidents (PIA) rate per million vehicle km is 0.02 (see Appendix 16B for data summary). This PIA is below the national average for a rural A-class road.

16.11.7. One of the collisions occurred on a weekend with the remaining four occurring on a weekday, one of the collisions occurred within the morning peak (08:00 – 10:00) and the remainder outside the peaks. All collisions were in fine weather, in dry road conditions; four occurred in daylight, one in darkness with street lighting present.

16.11.8. Two of the collisions were attributed to driver failing to look properly and one involved a cyclist colliding with pedestrians on footway. The other two collisions were attributed to driver loss of control while following too close and exceeding speed limit around the roundabout leading to collision.

The Drove / Wylds Road

16.11.9. A total of six PICs were recorded at this location; five were slight and one was serious in severity over the five-year period. Resulting in an annual accident rate of 1.2.

16.11.10. Given the length of the road section (approximately 0.45 km) and based on the count point along this road (ATC 5), the annual PIA rate per million vehicle km is 0.07. This PIA is below the national average for an urban A-class road.

16.11.11. All six of the collisions occurred on a weekday, with one of them occurring in the evening peak (16:00 – 18:00), one in the morning peak (08:00 – 10:00) and the remainder outside the peaks. Three collisions were in fine weather, one in rain, one in unknown weather conditions. Three collisions occurred in dry and wet road conditions, respectively. Of the collisions three occurred in daylight and three in darkness with street lighting present.

16.11.12. Four of the collisions were either due to failing to look properly or failing to judge other vehicles path, one was due to exceeding speed limit and other due to carelessness of the driver.

16.11.13. Three out of six collision were recorded as side swipe collision, two as shunt collisions and one as head-on collision.

Dunball Roundabout

16.11.14. A total of five PICs were recorded at this location, three slight and two serious in severity over the five-year period. This equates to an annual accident rate of 1.0.

16.11.15. Given the length of the road section (approximately 1.0 km) and based on the count point along this road (DfT counter 6416 for Link 12), the annual PIA rate per million vehicle km is 0.21. This PIA is below the national average for an urban A-class road.

16.11.16. All the collisions occurred on weekdays outside of the AM and PM peaks. All four collisions were in fine weather, and dry road conditions except one being recorded in unknown condition; with three occurring in daylight and the remaining two in the hours of darkness with street lighting present.

16.11.17. All collisions can be attributed to driver error and behaviour.

A38 Taunton Road/Huntworth Roundabout

16.11.18. A total of five PICs were recorded at this location or an annual accident rate of 1.0, with all of them being recorded as slight in severity over the five-year period.

16.11.19. Given the length of the road section (approximately 0.4 km) and based on the count point along this road (DfT counter 57970 for Link 13), the annual PIA rate per million vehicle km is 0.24. This PIA is below the national average for an urban A-class road.

16.11.20. One collision occurred on a weekend with the remaining four occurring on a weekday, with one collision recorded outside the peaks. Four collisions were in fine weather and one collision with unknown condition; four occurred in dry road conditions and one in wet road conditions. One of collisions was recorded within the hours of darkness with street lighting present.

16.11.21. All of the collisions within this cluster can be attributed to driver error and behaviour.

Summary

16.11.22. A number of collision clusters were identified, but it is notable that shunt collisions due to driver behaviour featured heavily within the data. The annual PIA rates calculated from the collision data are below the national average on all accident clusters assessed. The collision data revealed that there are no underlying highway design and / or safety issues within the Study Area, with no patterns of collision type, location, or movement revealed by the data. Therefore, due to the level of traffic associated with the Proposed Works and strict routing and timing of the traffic, it is unlikely to cause road safety issues.

Driver Delay

16.11.23. The increase of traffic flows resulting from the Proposed Works is predicted to be very low (total traffic increase was less than 0.5% on links considered (**Table 16-30** and **Table 16-31**)) as such the traffic effect from the Proposed Works alone is expected to be **Negligible**, and therefore traffic modelling including junction modelling has not been considered necessary.[26]

16.11.24. A high-level assessment of driver delay has been undertaken as part of the cumulative effects capacity assessment (see **Chapter 21: Cumulative Effects Assessment**) and has been based on professional judgement.

16.12 Assessment of cumulative effects

Inter-Project Effects

16.12.1. There is the potential for traffic and transport effects associated with the Proposed Works to interact with or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

16.12.2. An assessment inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-Project Effects

16.12.3. The traffic and transport assessment, particularly the change in trip generation as a result of the Proposed Works has been considered within the air quality (**Chapter 6: Air Quality**), ecology

[26] Whilst the criteria set out in Section 16.6 have been updated to reflect the latest guidance, it should be noted that in the 2022 Scoping Report submitted to the ONR for the Proposed Works, noted the magnitude of change for driver delay would be negligible for a Change in total traffic or HGV flows of less than 30%, This approach was agreed within the in the ONR scoping opinion.

(**Chapter 8 Terrestrial Biodiversity and Ornithology**), and noise and vibration (**Chapter 15 Noise and Vibration**) assessments.

16.12.4. A summary of the potential intra-project effects is also provided in **Chapter 21 Cumulative Effects Assessment**.

16.13 Summary

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
A39 Quantock Rock					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible	The Proposed Works traffic is expected to increase total traffic on the A39 Quantock Road by just 0.1% and HGV flows by 0.3% during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Additionally, transport investments in Sedgemoor aimed at enhancing the operational capacity of the highways will alleviate existing capacity constraints, ensuring minimal impact on driver delays due to the additional traffic associated with HPB. ,
	Road Safety	Rule 2 / Medium	Negligible	Negligible	The cluster analysis has not identified any underlying highway safety identified on this link. As such there are no existing highway safety issues that could be exacerbated by the vehicle movements associated with the proposed decommissioning work.
A39 Homberg Way					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible	The Proposed Works traffic is projected to increase total traffic on the A39 Homberg Way by only 0.1% and HGV flows by 0.2% during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Furthermore, transport investments in Sedgemoor aimed at

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					enhancing highway operational capacity will address existing constraints, ensuring that the additional traffic associated with HPB will have minimal impact on driver delays.
	Road Safety	Rule 2 / Medium	Negligible	Negligible	The cluster analysis has not identified any underlying highway safety identified on this link. As such there are no existing highway safety issues that could be exacerbated by the vehicle movements associated with the proposed decommissioning work.
A38 Bristol Road					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible	The Proposed Works traffic is anticipated to increase total traffic on the A39 Bristol Road by just 0.1%, with a 0.1% rise in HGV flows during the peak periods in both 2030 and 2034, leading to a negligible impact on the route. Additionally, planned transport investments in Sedgemoor to enhance highway operational capacity will resolve existing constraints, ensuring that the additional traffic associated with HPB will have minimal impact on driver delays.
	Road safety	Rule 2 / Medium	Negligible	Negligible	From the cluster analysis, no specific accident patterns have been identified on this link, and most accidents are attributed to driver behaviour. Therefore, there are no existing highway safety issues that could be exacerbated by the construction vehicle movements associated with the proposed decommissioning work.

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
A38 Taunton Road					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible	The ~~in~~ Proposed Works traffic is expected to increase total traffic on the A38 Taunton Road by only 0.1%, with a 0.1% rise in HGV flows during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Moreover, planned transport investments in Sedgemoor to improve highway operational capacity will eliminate existing constraints, ensuring minimal impact on driver delays due to the additional traffic associated with HPB.
	Road safety	Rule 2 / Medium	Negligible	Negligible	Based on cluster analysis, there is no underlying highway safety issues identified along this link, collisions are attributed to driver error / behaviour. Therefore, the proposed decommissioning traffic is not expected to have a negative impact upon the link.
A38					
	Driver Delay	Rule 1 / Low	Negligible	Negligible	The Proposed Works traffic is projected to increase total traffic on the A38 Bristol Road by 0.3%, with a 0.1% rise in HGV flows during the peak periods in both 2030 and 2034, having a negligible impact on the route. Additionally, planned transport investments in Sedgemoor to enhance highway operational capacity will address existing constraints, ensuring minimal

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					impact on driver delays due to the additional traffic associated with HPB.
	Road safety	Rule 1 / Low	Negligible	Negligible	The cluster analysis did not identify any underlying highway safety issues. The Proposed Works are not anticipated to have a negative impact on road safety based on cluster analysis findings.
A39 between Dunball roundabout and Dunball Interchange					
	Driver Delay	Rule 1 / Low	Negligible	Negligible	The Proposed Works traffic is expected to increase total traffic on the A39 by 0.4%, with a 0.9% rise in HGV flows during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Furthermore, transport investments planned in Sedgemoor to improve highway operational capacity will resolve existing constraints, ensuring minimal impact on driver delays from the additional traffic associated with HPB.
	Road safety	Rule 1 / Low	Negligible	Negligible	Based on the cluster analysis there are no existing highway safety issues that could be exacerbated by the vehicle movements associated with the proposed decommissioning work.
A38 Huntworth Lane					
	Driver Delay	Rule 1 / Low	Negligible	Negligible	~~in~~

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					The Proposed Works traffic is anticipated to increase total traffic on A38 Huntworth Lane by 0.4%, with a 1.2% rise in HGV flows during peak periods in both 2030 and 2034, leading to a negligible impact on the route. Additionally, planned transport investments in Sedgemoor aimed at improving highway operational capacity will address existing constraints, ensuring that driver delays from the additional traffic associated with HPB will be minimal.
	Road safety	Rule 1 / Low	Negligible	Negligible	Based on cluster analysis, no underlying highway safety issues have been identified along this link; collisions have been attributed to driver error / behaviour. Therefore, the anticipated decommissioning traffic is unlikely to have a detrimental impact on the link.

17

People and Communities

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17 People and Communities

17.1 Introduction

17.1.1. This chapter presents the baseline and the assessment of likely significant socio-economic and health effects with respect to people and communities. It describes the key receptors within the vicinity of the Proposed Works and the sensitivity of these receptors. The change in title from "Socio-economics" used in the EIA Scoping Report to "People and Communities" used here reflects evolving Environmental Impact Assessment (EIA) practice in response to updated legislation and does not change the scope of the issues addressed.

17.1.2. This chapter should be read in conjunction with the description of the Proposed Works as presented in **Chapter 2: The Decommissioning Process, Chapter 6: Air Quality, Chapter 14: LVIA** and **Chapter 15: Noise and Vibration**, which also assess relevant determinants of health and are discussed in the context of people and communities this chapter.

17.2 Relevant legislation, policy and technical guidance

Legislation

17.2.1. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)[1] require the environmental statement (ES) to provide a description of the likely effects of the Proposed Works on population and human health. However, there are no specific legislative requirements or guidelines for socio-economic/people and communities assessment set out in any statutory instruments or EIA advisory guidance.

Policy

17.2.2. A summary of the relevant policies is given in **Table 17-1**.

Table 17-1 - Policy relevant to people and communities

Policy Reference	Policy Relevance
National policy	
National Planning Policy Framework (NPPF)[2]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner*". Whilst the

[1] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024). Updated by The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 2018 (legislation.gov.uk) (Accessed August 2024)

[2] UK Government (2023). National Planning Policy Framework (NPPF). (Online). Available at: National Planning Policy Framework (publishing.service.gov.uk). (Accessed August 2024).

Policy Reference	Policy Relevance
	NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it provides information in relation to achieving sustainable development and relevant for the assessment of the Proposed Works. Section 2 states that achieving sustainable development means that the planning system has three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways so that opportunities can be taken to secure net gains across each of the different objectives. While the second objective concerns housing, the others cover economic and environmental objectives as follows (paragraph 8): *"an economic objective – to help build a strong, responsive and 28655234 competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;* *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."* Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above policy, it needs to be considered in the context of the application.
Local policy	
The Joint Local Enterprise Partnership (LEP) Energy Strategy: Cornwall and Isles of Scilly, Dorset and Heart of the South West (2019)[3]	Local Industrial Strategy to translate the ambitions and activities of the national strategy into local economies and activities. The three key objectives are: *Integrated: The energy system needs to be smart, resilient, and secure.* *Affordable: The energy system needs to be affordable, to alleviate fuel poverty, and to allow businesses to be competitive.* *Zero Carbon: The energy system needs to decarbonise by 80% by 2050 to meet the legally binding targets of the Climate Change Act and mitigate the impact of climate change.* The pursuit of a low carbon economy through nuclear can bring socio-economic benefits such as "*addressing fuel poverty, improved air quality, improved health and wellbeing, and resilience to fluctuations in imported fuel*

[3] Carbon Trust (2019). Joint LEP Energy Strategy. Cornwall and Isles of Scilly, Dorset and Heart of the South West LEPs. (online). Available at: https://heartofswlep.co.uk/wp-content/uploads/2018/02/5.-Joint-LEP-Energy-Strategy-Delivery-Plan-v4.2-02.01.19-FINAL-converted.pdf (Accessed August 2024).

Policy Reference	Policy Relevance
	prices". Whilst the strategy highlights benefits of nuclear, the strategy does not specifically mention decommissioning.
Heart of the South West Local Industry Strategy (HSWLIS) (2020)[4]	The purpose of HSWLIS is to set out how the area can fulfil its potential (capitalising on new and emerging technologies whilst reducing the area's carbon footprint; increasing social mobility; and protecting and enhancing the natural environment). Energy is a key priority with a future opportunity recognised as the following: *"the nuclear industry – centred on Hinkley Point C and its legacy, the UK's first new nuclear power station in 20 years, and aligned with the Nuclear Sector Deal*" Decommissioning is stated to bring many opportunities, such as expanding supply chains, seizing exports markets and increasing high value job numbers, with the global nuclear market expected to grow. This is further endorsed and facilitated by the Hinkley Supply Chain programme[5].
Adopted West Somerset Local Plan to 2032 (2016)[6]	Policies of relevance to socio-economics include: EC1: Widening and Strengthening the Local Economy "*Proposals which will make the West Somerset economy stronger and more diverse and that are likely to increase the proportion of higher paid jobs locally will be supported*." Policy EC7: Training and Educational Provision "*Proposals which strengthen the range and quality of training opportunities offered within the area will be supported*." "*Development proposals that combine education, training and, employment functions and opportunities in one location will be supported provided that they do not adversely affect the vitality and viability of existing centres*." Policy NH10: Development in Proximity to Hinkley Point Nuclear Power Station "Development proposals in the consultation zones will be considered inconsultation with the office for nuclear regulation (ONR), having regard to the

[4] The Heart of the South West Local Enterprise Partnership (2020). Heart of the South West Local Industry Strategy Heart of the South West Local Industry Strategy. (online). Available at: https://heartofswlep.co.uk/wp-content/uploads/2020/11/201119-Heart-of-the-South-West-Local-Industrial-Strategy.pdf (Accessed: August 2024).

[5] Hinkley Supply Chain Team *The Hinkley Supply Chain* Available at: https://www.hinkleysupplychain.co.uk/ (Accessed August 2024).

[6] West Somerset Council (2016). Adopted *West Somerset Local Plan to 2032* [online]. Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (Accessed August 2024).

Policy Reference	Policy Relevance
	scale of development proposed, its location, population distribution of the area and the impact on public safety, to include how the proposal would impact on local emergency planning arrangements and other planning criteria."
Somerset Council: Somerset Recovery and Growth Plan (2021)[7] Somerset Economic Futures (2023)[8]	This plan provides an overarching perspective for economic development. The three key ambitions reference specific economic activities, demonstrating the strategy for growth within the authority's administrative area, as follows: ***Energy futures**, identifies the Gravity development as part of a clean growth cluster, and a clean energy innovation zone, contributing to the ambition to become an exporter of low carbon energy* ***Engineering futures**, through support for aerospace innovation and the Future of Flight Programme* ***Digital futures**, through support for the Taunton Digital Innovation Centre and a digital innovation zone* The Plan also references more general support for employment, skills and inclusion, the business environment, ideas and innovation, places and local infrastructure including broadband, mobile, cycling, walking, rail and roads. In the supporting Somerset Economic Futures document, Hinkley is specifically identified as a legacy and opportunity for future growth and is included in scenarios with more dynamic changes set against a "Business as Usual" scenario with greater economic risks.

[7] Somerset's Local Authorities (2021) *Somerset Recovery and Growth Plan* [online]. Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Business%20%20and%20Economy/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FBusiness%20%20and%20Economy%2FSomerset%20Recovery%20and%20Growth%20Plan%20%2Epdf&parent=%2Fsites%2FSCCPublic%2FBusiness%20%20and%20Economy&p=true&ga=1] (Accessed August 2024).

[8] Somerset Council (2023). Somerset Economic Futures – Final Report [online]. Available at: Final report - Post-PMO feedback DRAFT FINAL.pdf (somerset.gov.uk) (Accessed August 2024).

Technical guidance

17.2.3. A summary of the relevant technical guidance informing this chapter is given in **Table 17-2**.

Table 17-2 - Technical Guidance relevant to people and communities

Technical Guidance	Context
International Association for Impact Assessment: Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects[9]	The guidance provides a source of methodologies for conducting activities supporting social assessment, particularly those for identifying and representing community issues and assessing methods of resolution.
The Green Book (and supplementary guidance) published by UK government[10]	The Green Book provides a broad framework for how policies, programmes and projects in the UK should be appraised and evaluated to inform decision making. It sets out guidelines for how the economic and social effects of policy should be assessed. It contains advice on the scoping of costs and benefits to be included in assessment, the time period for assessment and the use of discount rates. It contains various supplementary guidance on specific assessment of environmental effects, for example of health, crime and air quality.
The Additionality Guide, published by UK Government[11]	Provides more specific guidance on how to assess the impact of a policy intervention (or a public or private sector investment) on the local, regional and national economy. Additionality is the "*extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention*".
Public Health England, Health Impact Assessment in spatial planning[12]	This guidance provides advice and data sources for health impact assessment in England including further national and international references.

[9] International Association for Impact Assessment: (2015). *Social Impact Assessment: Guidance for Assessing and Managing the Social Impacts of Projects*. (online) Available at: https://www.iaia.org/uploads/pdf/SIA_Guidance_Document_IAIA.pdf (Accessed August 2024).
[10] HM Treasury and Government Finance Function (2022). *The Green Book*. (online) Available at: https://www.gov.uk/government/publications/the-green-book-appraisal-and-evaluation-in-central-governent (Accessed August 2024).
[11] Homes and Communities Agency (2014). *Additionality Guide*. (online) Available at: https://www.gov.uk/government/publications/additionality-guide (Accessed August 2024).
[12] Scottish Health and Inequality Impact Assessment Network (SHIIAN) (2019). Health Impact Assessment Guidance for Practitioners. (Online) Available at: https://www.scotphn.net/wp-content/uploads/2015/11/Health-Impact-Assessment-Guidance-for-Practitioners-SHIIAN-updated-2019.pdf (Accessed August 2024).

The World Health Organization Health Impact Assessment guidance, tools and methods	The guidance, tools and methods are recognised as the leading international authority on the completion of human health impact assessments. The guidance covers a number of aspect areas that are linked to health impacts from projects, including transport, housing, and water and sanitation.
International Union for the Conservation of Nature: Social Impact Assessment in Environmental & Social Management System[13]	The guidance provides a succinct summary of the key elements in assessment as well as supplementary guidance focusing on the context and use of natural resources.
IEMA Guide to Effective Scoping of Human Health in Environmental Impact Assessment[14]	This guidance provides a clear definition of what is within the scope of human health and provides advice on wider health determinants that should be considered within the EIA.

17.3 Data gathering methodology

Study Area

17.3.1. The Study Area for the socio-economics assessment has been selected to cover the anticipated spatial distribution of potentially significant effects. Over time, the Hinkley Point Complex (comprising Hinkley Point A Nuclear Power Station (HPA), Hinkley Point B Nuclear Power Station (HPB) and Hinkley Point C Nuclear Power Station (HPC) has been subject to a period of socio-economic analysis using local and geographical definitions appropriate to the impacts of ongoing decommissioning of HPA, generation, defueling and future decommissioning of HPB and nuclear new build at HPC. The most detailed assessments are related to HPC and reflect analysis by Oxford Economics and consultation with local authorities. They include study areas for: the South West region; the "Construction Daily Commuting Zone" (CDCZ) covering local authority areas within a 90-minute commuting zone; and a single area combining the "Three Districts" of West Somerset, Taunton Deane and Sedgemoor.[15]

17.3.2. A reorganisation of local government in 2019 led to the creation of Somerset West and Taunton (SWT) Council comprising the former West Somerset and Taunton Deane Councils. In a further reorganisation in 2023, the unitary authority of Somerset Council replaced the five councils of Sedgemoor District Council, Somerset West and Taunton Council, South Somerset District, Mendip

[13] International Union for the Conservation of Nature (2016). Social Impact Assessment Guidance Note. (online) Available at: https://www.iucn.org/sites/default/files/2022-05/esms-social-impact-assessment-sia-guidance-note.pdf (Accessed A).
[14] Institute of Environmental Management and Assessment (IEMA) (2022). Guide to Effective Scoping of Human Health in Environmental Impact Assessment
[15] EN010001-005038-4.3 - Volume 2 - https://webarchive.nationalarchives.gov.uk/ukgwa/20190919184551mp_/https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010001/EN010001-005038-4.3%20-%20Volume%202%20-%20Hinkley%20Point%20C%20Development%20Site%201.pdf

District Council and Somerset County Council[16]. These changes do not alter the geographic areas defined within this ES chapter as the Three Districts or the CDCZ.

17.3.3. The data gathering and assessment uses alignment with the HPC analysis and draws on corresponding information using historical and current definitions according to the basis on which statistics are reported. As this assessment focuses on the employment at HPB that is not construction-related, CDCZ-related information is primarily considered as contextual. The selected levels of relevant spatial scale reflect the following commonly adopted classification:

- National level – England;
- Regional level – the South West Region; and
- Local level – Localities within the former Somerset West and Taunton and Sedgemoor administrative area (the "Three Districts").

Desk study

17.3.4. The assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of data sources. The principal data sources used to inform this chapter for potential effects comprise:

- UK Government Office of National Statistics (ONS); and
- Publicly available internet-based data sources.

17.3.5. In response to a specific point in the ONR Pre-application Opinion (see **Appendix 5A**; Section 3.1.2, paragraph 15), for further consideration of *human health impacts* and *impacts on fishing, maritime recreation and maritime commercial services*. **Appendix 5B** presents the relevant baseline assessment and associated conclusions. With reference to *human health impacts*, the technical note concludes that these impacts are considered in this chapter, **Chapter 6: Air Quality** and **Chapter 15: Noise and Vibration** and therefore do not require a separate assessment. With reference to *impacts on fishing, maritime recreation and maritime commercial services,* **Appendix 5B** concludes that due to the limited footprint and duration of the Proposed Works in the marine environment, coupled with the implementation of the applicable good practice measures, significant impacts are not anticipated and therefore no further assessment is required.

17.3.6. To ensure that any interactions between the Proposed Works in the marine environment and maritime recreational activities are managed safely, coupled with overarching project level safety measures, the following good practice measures are proposed:

- establishment of an exclusion zone around the Indicative Dismantling Works Area ("Works Area");

16 South West Councils (2024). Local Authorities in the South West. (Online). Available at: https://swcouncils.gov.uk/list-of-local-authorities/#:~:text=Somerset%20County%20Council%2C%20Mendip%20District,gov.uk%20for%20more%20information (Accessed August 2024)

- communication programmes with local ports and marine operators (including notice to mariners); and
- measures specific to vessel movements in constrained areas (such as ports), and additional physical mitigating measures (e.g. to prevent small craft drifting onto part-finished offshore engineering works).

17.3.7. These measures are included as good practice in **Table 17-18** and will be secured via the Environmental Management Plan (EMP).

Survey work

17.3.8. No specific surveys have been undertaken to inform this people and communities chapter. Existing publicly available information, coupled with the information presented in **Chapter 2: The Decommissioning Process** has been utilised in this assessment.

Data limitations

17.3.9. Data limitations reflect those of the main data sources:

- UK government (ONS); and
- applying to EDF internal data (such as GDPR).

17.3.10. More specific data limitations arise for:

- information regarding future employment opportunities, which are based more on publicly available information, and generic descriptions; and
- the propensity for people to retire before the statutory age, who are assumed to wish to retire as late as possible.

17.3.11. These limitations are considered unlikely to affect the outcome of the assessment because the levels of change arising from the Proposed Works are relatively small compared to the overall levels of uncertainty in government and future employment data and a conservative (pessimistic) approach has been adopted for workforce details and choice of retirement age.

17.4 Consultation

Overview

17.4.1. No specific consultation was undertaken for the peoples and communities chapter but the assessment reflects consultation under the other environmental aspects considered.

Pre-application Opinion

17.4.2. A Pre-application opinion was adopted by the ONR, on 7 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the assessment of effects on people and communities and confirmation of how these are addressed by the assessment is included in **Table 17-3**.

Table 17-3 - Summary of Pre-application Opinion Responses

Consideration	How addressed in the ES
In the environmental topic chapters, there are a number of receptors and aspects that do not appear to have been considered in the scoping exercise. These include impacts to human health and impacts to maritime recreation and commercial services (relevant to socio-economic and traffic and transport impact assessments); impacts to agricultural land use (relevant to socio-economic and soils and geology impact assessments)…	As set out in paragraph 17.3.5, In response to a specific point in the ONR Pre-application Opinion (see **Appendix 5A**; Section 3.1.2, paragraph 15), for further consideration of *human health impacts* and *impacts on fishing, maritime recreation and maritime commercial services*. These aspects are considered in **Appendix 5B**. In addition, a review has been undertaken of the wider health determinants, defined in the IEMA guidance[14], and is provided in **Appendix 17A.** The appendix signposts to where the health determinants are considered in the ES. Where appropriate, further assessment is provided within **Section 17.10** of this chapter.
In Chapter 16 (Socio-economics) three levels of study area are defined – local, regional and national. There is no justification for electing for three different study areas. For example, it could be suggested that different types of effect could be felt at different spatial scales. It could also be clarified that information on the national scale is only likely to be used for context.	To clarify, the commonly adopted spatial scales for assessment will be used as appropriate to the extent of the effects from each individual type of socio-economic impact. Of the potential effects identified, those on the employment market and business will be assessed at a regional scale while effects on walkers and cyclists near the Site will be assessed for the locality. The national scale will only be used to provide context. **Section 17.3** defines the three spatial extents used in this assessment.
Further evidence required in relation to: No indication of employment numbers to inform the socio-economic assessment. The socio-economic assessment suggests that there is currently not a high pressure on GPs in Somerset compared to the national average. This statement is potentially misleading as patients per GP cannot be considered in isolation, it needs to also be reconciled with the population age profile of the area.	Further detail is provided in **Section 17.5**, paragraph 17.5.17 of this chapter.

Non-statutory consultation

17.4.3. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

17.4.4. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

17.4.5. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. Comments relevant to the people and communities assessment are summarised in **Table 17-4.**

Table 17-4 Comments received during non-statutory consultation relevant to the people and communities assessment

Respondent	Comment received	Response
Round 1 consultation		
Heart of the South West Local Enterprise Partnership	Suggestion that the current construction and commissioning of two new reactors at Hinkley Point C should be considered in terms of transition to employment from HPB to HPC but also the cumulative impacts of demobilisation of the HPC construction workforce.	This is noted. Further assessment relating to the HPB workforce is considered within **Section 17.10**.
Heart of the South West Local Enterprise Partnership	Suggestion that clear pathways and alignment should be established with the aim of transitioning the local workforce to other sectors and opportunities and creating a socio-economic strategy that seeks to understand the transferrable skills from HPC construction roles to HPB decommissioning activity.	As a socially responsible operator, EDF will work to ensure resource deployment opportunities are taken wherever possible to meet both individual and business needs. Further detail is provided in **Section 17.6**.
Sedgemoor District Council	Suggestion that the Scoping Report lacks the quantitative information on the scale/type of workforce needed for each decommissioning phase, and how this compares to the existing baseline, or the future baseline at end of defueling, suggesting that it is difficult to draw any sort of conclusion on what should be scoped in or out from a socio-economic perspective.	EDF and NRS (formerly known as Magnox Ltd) understand the importance that existing station staff can play in decommissioning and are working together on a people plan for the Site for decommissioning. This assessment considers the socio-economic impact of the HPB decommissioning works.
Round 2 consultation – No comments relevant to the people and communities assessment provided.		

Technical Engagement

17.4.6. No technical engagement specific to the people and communities chapter has been undertaken.

17.5 Overall baseline

Current baseline: the local, regional and national level

Population

17.5.1. Somerset West and Taunton has a current population of 157,900 which makes up approximately 2.7% of the population in the South West and 0.2% of the population in Great Britain (see **Table 17-5**). Sedgemoor has a current population of 125,700 (32,200 less people than Somerset West and Taunton), making up approximately 2.2% of the South West population and 0.2% of the British Population. There is a difference in the ratio of men and women in the local Study Area; in Somerset West and Taunton there are 6% more women than men while in Sedgemoor and the south-west there are approximately 2% more.

Table 17-5 Population in Somerset West and Taunton in 2021 [17, 18]

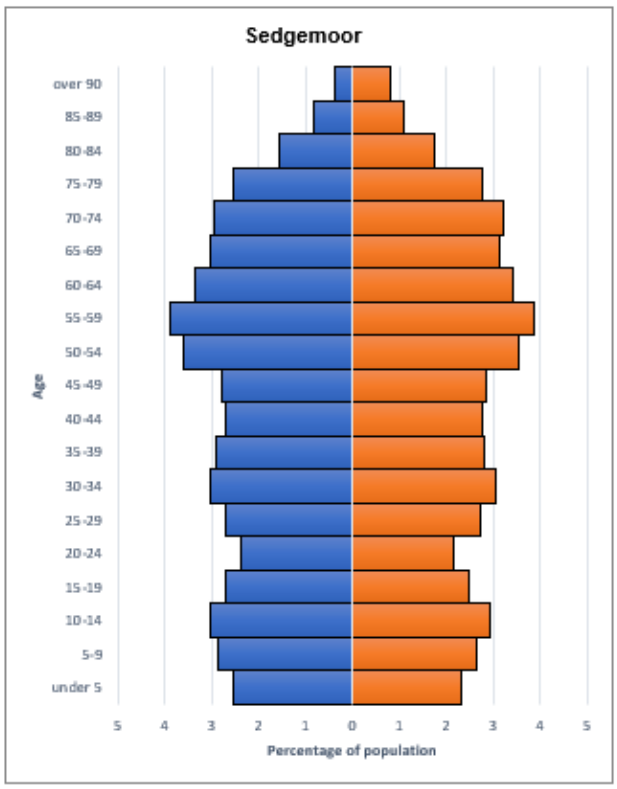
		Somerset West and Taunton	Sedgemoor	South West	Great Britain
All People	number	157,900	125,700	5,712,800	65,121,700
Males	number	76,800	62,300	2,796,000	31,874,600
Females	number	81,200	63,400	2,916,800	33,247,100
Number females as % of number males	%	106	102	104	104

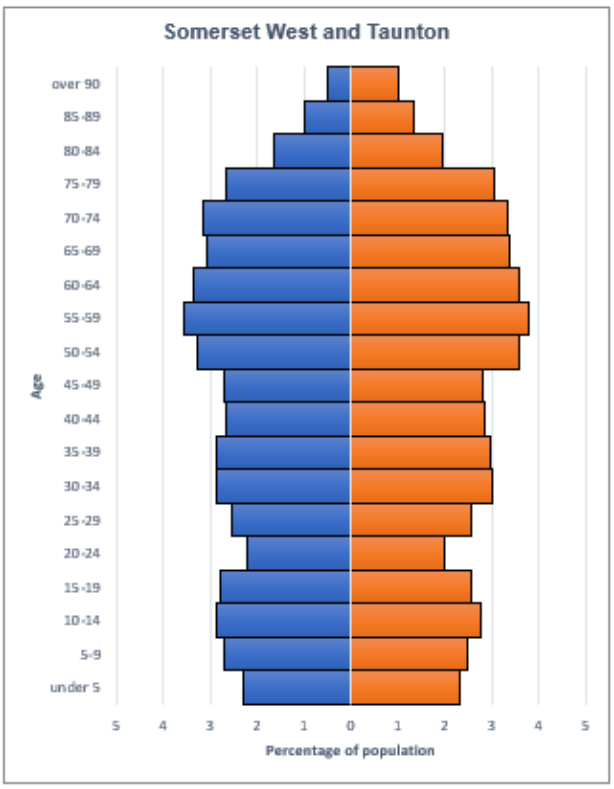
17.5.2. **Graphic 17-1** illustrates the current (2022)[19] age distribution of the population in the Sedgemoor, Somerset West and Taunton, the South West and England, with the largest age group being 55 to 59. The greater proportion of the population aged over 50 in the local authority areas is noticeable

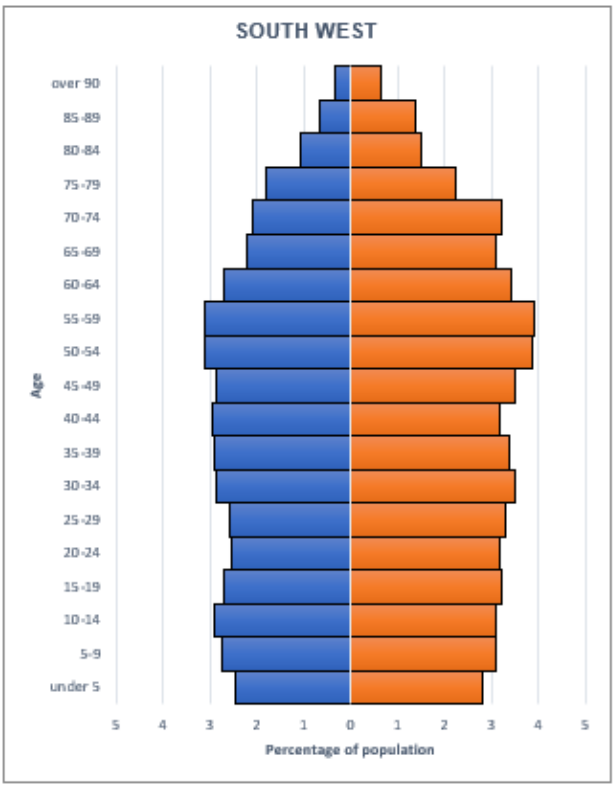
[17] NOMIS (2024). Labour Market Profile – Somerset West And Taunton. [online] Available at: https://www.nomisweb.co.uk/reports/lmp/la/1820328253/report.aspx?town=somerset%20west [Accessed August 2024].
[18] NOMIS (2024). Labour Market Profile - Sedgemoor. [online] Available at: https://www.nomisweb.co.uk/reports/lmp/la/1946157379/report.aspx [Accessed: August 2024].
[19] ONS (2022). How the population changed in Somerset West and Taunton: Census 2021. [Online] Available at: https://www.ons.gov.uk/visualisations/censuspopulationchange/E07000246/ (Accessed: August 2024).

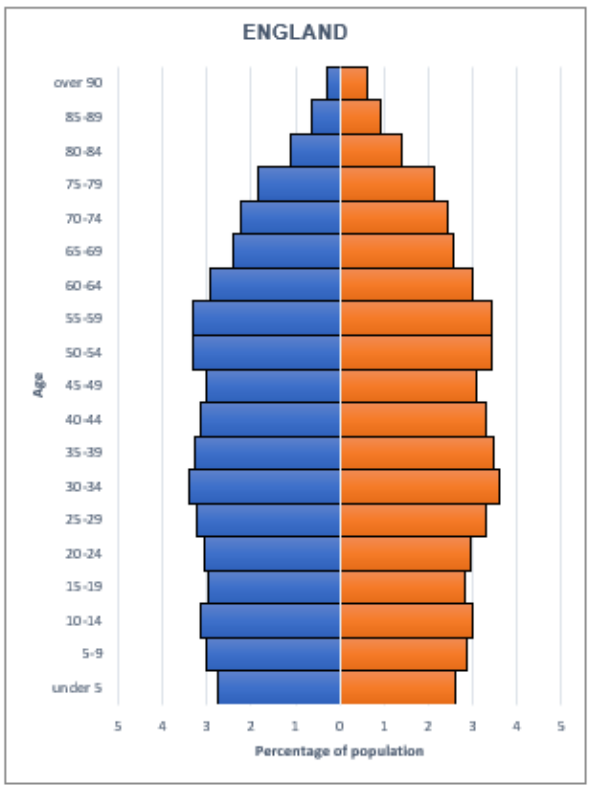
compared to the proportion regionally and nationally. Furthermore, since 2011, there has been an increase of 26.2% of individuals in the 65 years and over age group, the largest increase across all age groups between 2011-2021. This reflects the national trend towards an ageing population, also seen in Sedgemoor as well as that in Somerset West and Taunton, where there has been a substantial increase in those aged 70+ (see **Graphic 17.2** and **Graphic 17.3**).

Graphic 17.1 Current (2021) Age distribution for local, regional and national comparator areas

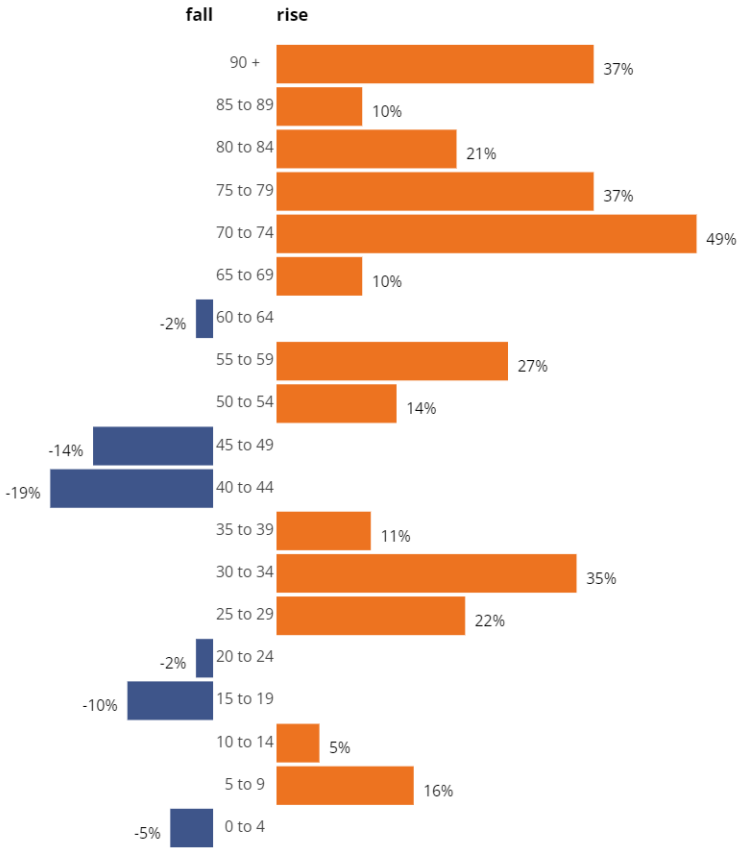




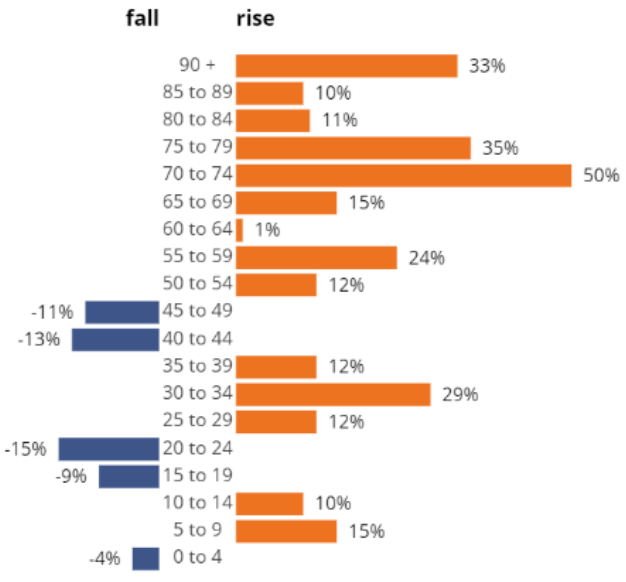




Graphic 17.2 Current (2021) Population change (%) by age group in Sedgemoor, 2011 to 2021



Graphic 17.3 Current (2021) Population change (%) by age group in Somerset West and Taunton, 2011 to 2021



17.5.3. The proportion of residents of working age (aged 16-64) within Somerset West and Taunton is lower than the regional average by approximately 3.0%, and lower than the national average by 5.2%. The differences are the same for men and women (-3.0%) in comparison to the regional average and similar in comparison to the national average (-5.1% and -5.5% respectively). Sedgemoor has a higher proportion of residents (59%) that are of working age compared to Somerset West and Taunton (57.7%) which, as in Somerset West and Taunton, is lower than the regional and national average, with the difference from these levels being greater for women (1.7% and 4.2% respectively) than men (1.5% and 3.6% respectively) (see **Table 17-6** and **Table 17-7**).

Table 17-6 Population of working age (16-64) in 2021 as % of total population[17, 18]

	Somerset West and Taunton (number)	Somerset West and Taunton (%)	Sedgemoor (number)	Sedgemoor (%)	South West (%)	Great Britain (%)
All People Aged 16-64	91,100	57.7	74,200	59	60.7	62.9
Males Aged 16-64	44,700	58.2	37,200	59.7	61.2	63.3
Females Aged 16-64	46,400	57.1	37,000	58.4	60.1	62.6

Table 17-7 Difference in working population at local levels compared to regional and national[17, 18]

	Somerset West and Taunton compared		Sedgemoor compared	
	South West (%)	Great Britain (%)	South West (%)	Great Britain (%)
All People Aged 16-64	-3.00	-5.20	-1.70	-3.90
Males Aged 16-64	-3.00	-5.10	-1.50	-3.60
Females Aged 16-64	-3.00	-5.50	-1.70	-4.20

Employment

17.5.4. The employment profile in Somerset West and Taunton for the period October 2022 to September 2023 shows that there is a larger proportion of the working age population who are economically active (84.8%) compared to the regional (81%) and national averages (78.8%). Whereas Sedgemoor shows a smaller proportion of the population are economically active (81.7%) compared to the regional and national averages (see **Table 17-8** and **Table 17-9**). Levels of unemployment are higher in Somerset West and Taunton (3.4%) than the regional average (2.5%) but lower than the national average (3.7%). Sedgemoor unemployment level (3%) is higher than the regional average and less than the national average[17 18].

17.5.5. In 2022, the job density (number of jobs per working age population) in Somerset West and Taunton was 0.87 which is lower than the regional average (0.89) and the same as the national average (0.87). The job density for Sedgemoor is lower than that for Somerset West and Taunton with the regional average and national average being 0.80[17 18].

Table 17-8 Employment and Unemployment levels in (October 2022 - September 2023)[17 18]

	Somerset West and Taunton (%)	Sedgemoor (%)	South West (%)	Great Britain (%)
Economically Active	84.8	81.7	81.0	78.8
In Employment	84.3	76.7	78.9	75.8
Employees	67.0	69.7	67.6	66.3
Self-Employed	17.3	7.0	11.1	9.2
Unemployed (Model-Based)	3.4	3.0	2.5	3.7

Table 17-9 Employment differences in Sedgemoor and Somerset West and Taunton compared to the South West and Great Britain[17 18]

	Somerset West and Taunton compared		Sedgemoor compared	
	South West (%)	Great Britain (%)	South West (%)	Great Britain (%)
Economically Active	3.8	6	0.7	2.9
In Employment	5.4	8.5	-2.2	0.9
Employees	-0.6	0.7	2.1	3.4
Self-Employed	6.2	8.1	-4.1	-2.2

	Somerset West and Taunton compared		Sedgemoor compared	
Unemployed (Model-Based)	0.9	-0.3	0.5	-0.7

17.5.6. In Somerset West and Taunton, and Sedgemoor, the structure of occupations differs appreciably from the South West and Great Britain. The proportion of the total employment classified as 'Managers, Directors and Senior Officials' occupations is 6.9% in Somerset West and Taunton, which is 3% less than in the South West (9.9%) and 3.6% less than the proportion nationally (10.5%). A greater proportion of individuals in Sedgemoor (13.0%) are classified in this occupational group compared to Somerset West and Taunton (see **Table 17-10**), which is also appreciably higher than the region and national averages.

17.5.7. The proportion of 'Professional Occupations' in Somerset West and Taunton (21.5%) and Sedgemoor (16.3%) are appreciably lower than the South West (25.5%) and Great Britain (27%). There is a notably higher proportion of individuals in the 'Caring, Leisure and Other Service Occupations' in Somerset West and Taunton (14%) compared to the national and regional averages of 8% and 7.9% respectively (see **Table 17-10**).

Table 17-10 Employment by occupation in Somerset West and Taunton and Sedgemoor (October 2022 – September 2023) [17, 18]

	Somerset West and Taunton (number)	Somerset West and Taunton (%)	Sedgemoor (number)	Sedgemoor (%)	South West (%)	Great Britain (%)	Somerset West and Taunton compared to		Sedgemoor compared to	
							South West (%)	Great Britain (%)	South West (%)	Great Britain (%)
1 Managers, Directors And Senior Officials	5,300	6.9	7,900	13.0	9.9	10.5	-3	-3.6	3.1	2.5
2 Professional Occupations	16,500	21.5	9,300	16.3	25.5	27.0	-4	-5.5	-9.2	-10.7
3 Associate Professional & Technical	11,700	15.3	Sample Size Too Small	Sample Size Too Small	13.8	14.9	1.5	0.4	-	-
4 Administrative & Secretarial	8,500	11.1	Sample Size Too Small	Sample Size Too Small	9.8	9.6	1.3	1.5	-	-
5 Skilled Trades Occupations	6,400	8.3	7,700	13.4	10.9	8.7	-2.6	-0.4	2.5	4.7

6 Caring, Leisure And Other Service Occupation	10,700	14.0	Sample Size Too Small	Sample Size Too Small	8.0	7.9	6	6.1	-	-
7 Sales And Customer Service Occupation	6,000	7.8	Sample Size Too Small	Sample Size Too Small	6.0	6.1	1.8	1.7	-	-
8 Process Plant & Machine Operatives	Sample Size Too Small	Sample Size Too Small	Sample Size Too Small	Sample Size Too Small	5.4	5.4	-	-	-	-
9 Elementary Occupations	9,000	11.7	11,500	20.00	10.5	9.5	1.2	2.2	9.5	10.5

17.5.8. The economic structure for the Three Districts is similar to that in the South West and Great Britain although differences in Somerset West and Taunton and Sedgemoor are greater (see **Table 17-11**). Manufacturing comprises 8.8% of the economy in the Three Districts and 8.6% and 7.6% in the South West and Great Britain respectively, but 5.1% in Somerset West and Taunton and 13.5% in Sedgemoor. A similar combination of offsetting activities is seen in Health & Social Work where the 21.7% and 8.7% in Somerset West and Taunton and Sedgemoor respectively are in combination 16.3%, nearer the regional and national values of 14.5% and 13.5% respectively. The high combined value in for 'D: Electricity, Gas' of 1.2%, is three times higher than the national and regional value of 0.4%, reflects the activities at Hinkley Point. The sectors that are less represented in the Three Districts are Finance & Insurance, and Professional, Scientific, Technical.

Table 17-11 - Economic structure in Local Authority areas and Comparators (2022)

Sector	Three Districts (number)	Three Districts (%)	Somerset West And Taunton (%)	Sedgemoor (%)	South West (%)	Great Britain (%)
B: Mining & Quarrying	75	0.1	0	0.1	0.1	0.2
C: Manufacturing	10,500	8.8	5.1	13.5	8.6	7.6
D: Electricity, Gas	1,400	1.2	1.8	0.3	0.4	0.4
E: Water, Sewerage Waste	1,050	0.9	0.9	0.9	1	0.7
F: Construction	7,000	5.8	5.8	5.8	5.5	4.9
G: Trade & Vehicle Repair	16,000	13.4	13	13.5	13.7	14
H: Transport & Storage	6,000	5.0	2.2	8.7	4.3	5
I: Accommodation & Food	12,000	10.0	10.1	9.6	9.9	8
J: Information & Communication	1,850	1.5	1.8	1.2	3.3	4.6
K: Finance & Insurance	1,750	1.5	2.2	0.5	2.8	3.3
L: Real Estate	1,700	1.4	1.4	1.3	1.8	1.9
M: Professional, Scientific, Technical	7,500	6.3	7.2	4.8	8.4	9.1

Sector	Three Districts (number)	Three Districts (%)	Somerset West And Taunton (%)	Sedgemoor (%)	South West (%)	Great Britain (%)
N: Administrative & Support	11,500	9.6	5.1	15.4	7.1	9
O: Public Administration & Defence	5,500	4.6	5.1	3.8	4.4	4.7
P: Education	11,500	9.6	10.1	8.7	9.4	8.6
Q: Health & Social Work	19,500	16.3	21.7	8.7	14.5	13.5
R: Arts, Entertainment, Recreation	3,000	2.5	2.5	2.4	2.8	2.4
S: Other Services	1,950	1.6	1.8	1.3	1.9	2
Total (*)	*119,775*	*100*	*98*	*101*	*100*	*100*

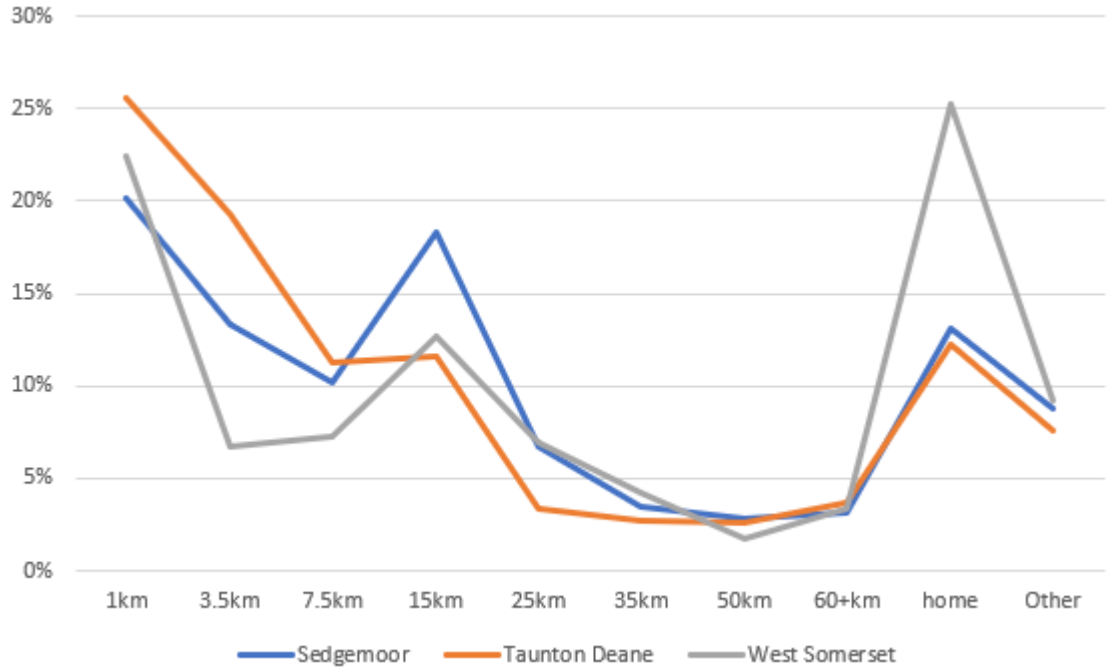
(*) Totals for individual districts are based on figures directly reported by ONS.

Travel to work patterns

17.5.9. Information on the commuting patterns from local settlements is provided by travel to work data from the national census. Travel to work data from the 2011 census is used in preference to 2021 as the underlying drivers reflecting geography are likely to have changed less than uncertainty introduced by Covid-19 in 2021.

17.5.10. **Graphic 17.4** shows the travel to work distance data for the three local authorities now comprising the two of Sedgemoor and Somerset West and Taunton. For all three areas there are peaks at 1 km and at 15 km which reflect the economic activities in the main towns and the typical distance of 15 km between a number of the pairs of them, such as Bridgwater to Taunton and Taunton to Chard. HPB is also approximately the same distance from Bridgwater.

Graphic 17.4 Travel to work distances for people in Sedgemoor, Taunton Deane, and West Somerset (2011 Census)

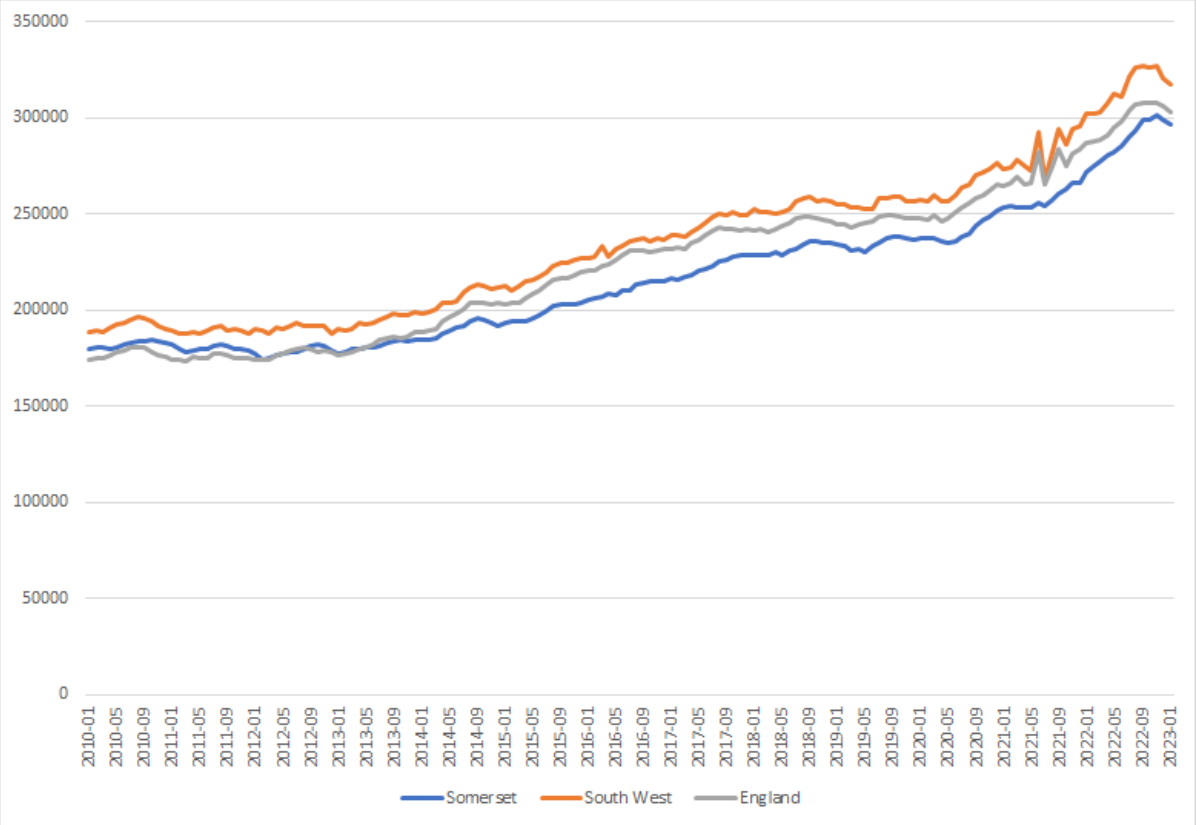


Housing Market

The housing market in Somerset has shown a trend in prices which is very closely aligned with the trend in the South West and England, although in 2011 it was above the overall level in England, it is currently lower than both the England and South West average (see **Graphic 17.5**)[20].

[20] HM Land Registry data (2024). *UK House Price Index: average price for all properties* (Online). Available at: https://landregistry.data.gov.uk/ (Accessed May 2024).

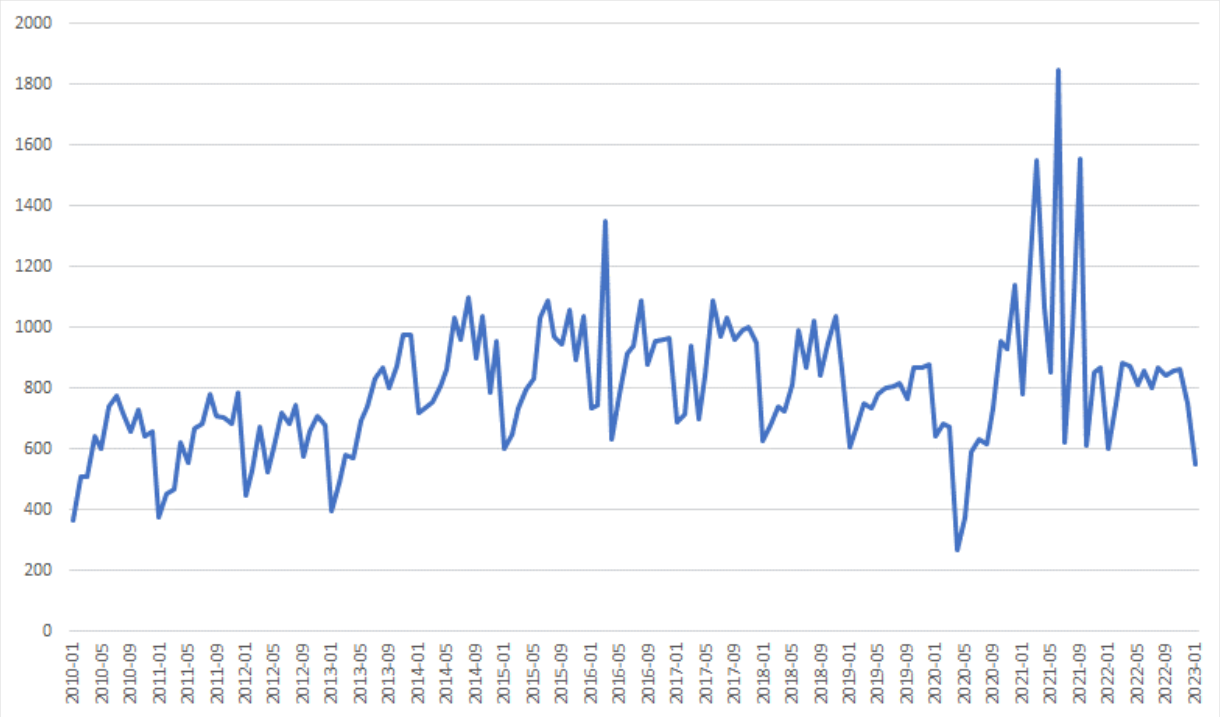
Graphic 17.5 House Prices in Somerset, the South West and England (2010-2023)



17.5.11. The volume of sales in the housing market in Somerset has averaged approximately 800 properties per month with a relatively stable annual pattern though with significant variation in 2021 in the period corresponding with the end of Covid-19 pandemic (See **Graphic 17.6**)[21].

[21] HM Land Registry data (2024). *UK House Price Index: Sales volume by type of property* (Online). Available at: https://landregistry.data.gov.uk (Accessed August 2024).

Graphic 17.6 Monthly House Sales Volumes in Somerset (2010-2023)



Education

17.5.12. Schools in Somerset West and Taunton and Sedgemoor are the responsibility of Somerset Council. Across Somerset, the total number of schools (primary and secondary) has declined from 259 to 255 between 2010 and 2021 and now comprises 217 primary schools and 38 secondary schools. However, the number of pupils attending both primary and secondary schools in the County has increased from 66,036 to 68,991 over the same period[22]. The percentage by which overcapacity schools are oversubscribed has increased, from 4.17% in 2010 to 5.4% in 2021, with the period from 2019 to 2021 showing the steepest increase (4.7%). However, the level of oversubscription has decreased when compared to the aggregate of all schools in Somerset, from 0.85% in 2010 to 0.42% in 2021. This shows an overall improvement, but an increase in pressure on schools which were already over-subscribed (see **Table 17-12)**.

[22] National Statistics (2024). Academic Year 2022/23 *Schools, pupils and their characteristics*. [online] Available at: https://explore-education-statistics.service.gov.uk/find-statistics/school-pupils-and-their-characteristics#explore-data-and-files [Accessed August 2024]

Table 17-12 – Somerset Schools Pupil Statistics (2023)[22]

	2017/18		2018/19		2020/21		2021/22		2022/23	
	Somerset	**England**	**Somerset**	**England**	**Somerset**	**England**	**Somerset**	**England**	**Somerset**	**England**
Pupils on roll	67,660	7,654,797	68,363	7,740,594	68,991	7,872,735	69,131	7,940,834	69,456	7,993,753
State-funded Primary schools	216	16,766	216	16,769	217	16,791	218	16,786	217	16,783
State-funded Secondary schools	38	3,436	38	3,448	38	3,458	38	3,473	36	3,444
Number of schools at or in excess of capacity as a percentage of total schools (%)	18.9%	20.0%	20.1%	19.4%	14.1%	17.5%	14.9%	18%	16.2%	18.1%
Pupils in places that exceed their school's capacity as a percentage of total places	0.6%	0.6%	0.5%	0.6%	0.4%	0.6%	0.5%	0.7%	0.7%	0.7%

17.5.13. The qualifications of the population in Somerset West and Taunton show levels appreciably above those for the South West and Great Britain averages, at all educational levels (NVQ1-NVQ4), whereas Sedgemoor is appreciably below these attainment levels (see **Table 17-13)**.

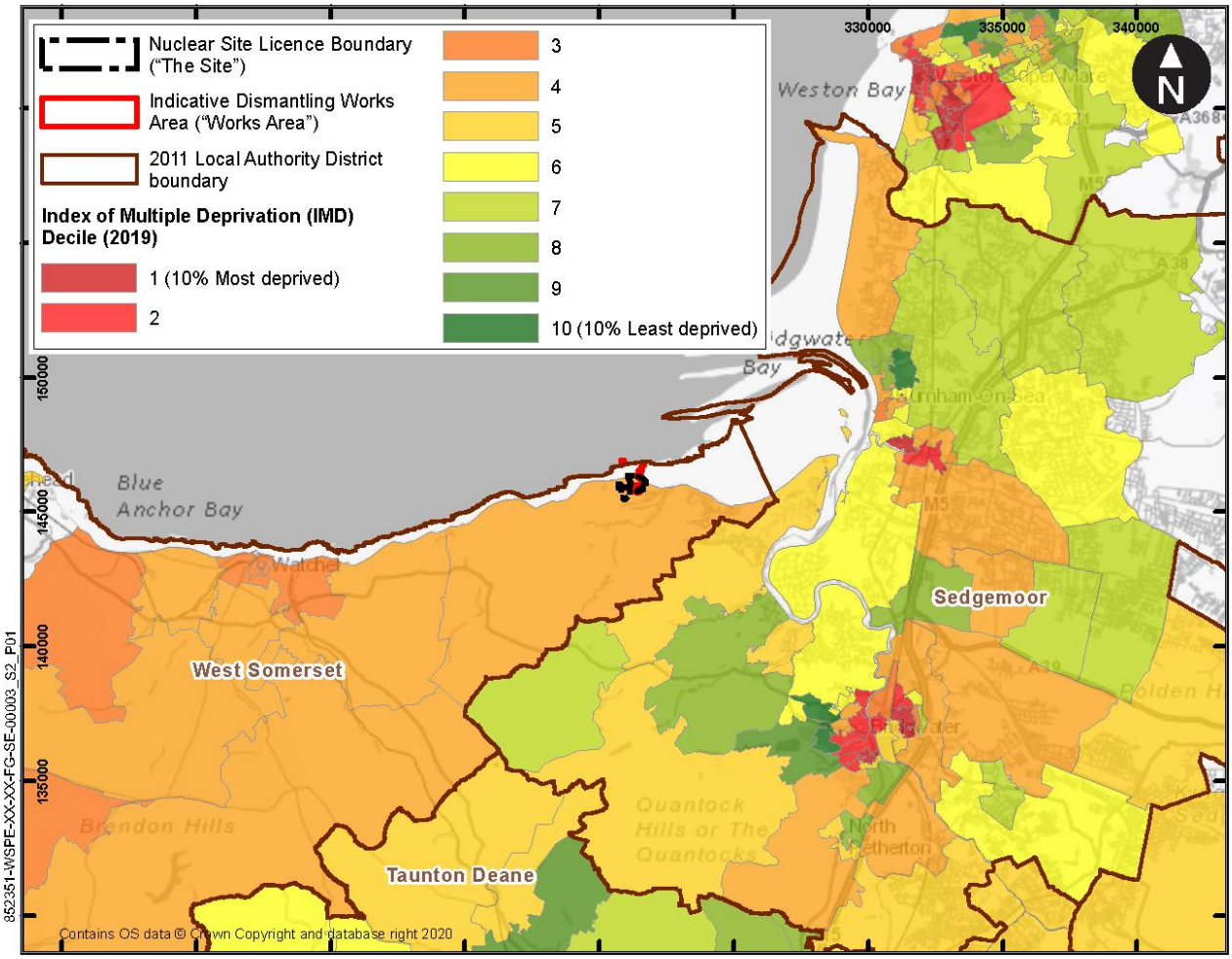
Table 17-13 - Qualifications (January 2023 – December 2023)

	Somerset West and Taunton (number)	Somerset West and Taunton (%)	Sedgemoor (Number)	Sedgemoor (%)	South West (%)	Great Britain (%)
NVQ4 and Above	40,800	48.1	24,000	33.8	43.8	47.3
NVQ3 and Above	60,900	71.8	45,200	63.7	68.2	67.8
NVQ2 and Above	78,600	92.7	62,300	87.9	88.2	86.5
NVQ1 and Above	78,900	93.1	62,900	88.8	91.3	89.0
Other Qualifications	-	-	-	-	3.6	4.6
No Qualifications	-	-	-	-	5.1	6.5

Deprivation

17.5.14. The levels of deprivation can be seen using the Index of Multiple Deprivation (IMD) and the more specific factors ('domains') that comprise the overall index. In general, the levels for IMD near HPB reflect a variety which is generally orientated towards the middle of the range of deprivation (See **Graphic 17.7**). The Three Districts cover three local authority areas which are separately assessed and ranked compared to the national total of 317 local authority areas. In this comparison, all three are in a group slightly more deprived than the national average, with West Somerset ranking 142, Taunton Deane 149 and Sedgemoor 121.

Graphic 17-7 The Index of Multiple Deprivation (IMD) for the area of the Three Districts near HPB[23]

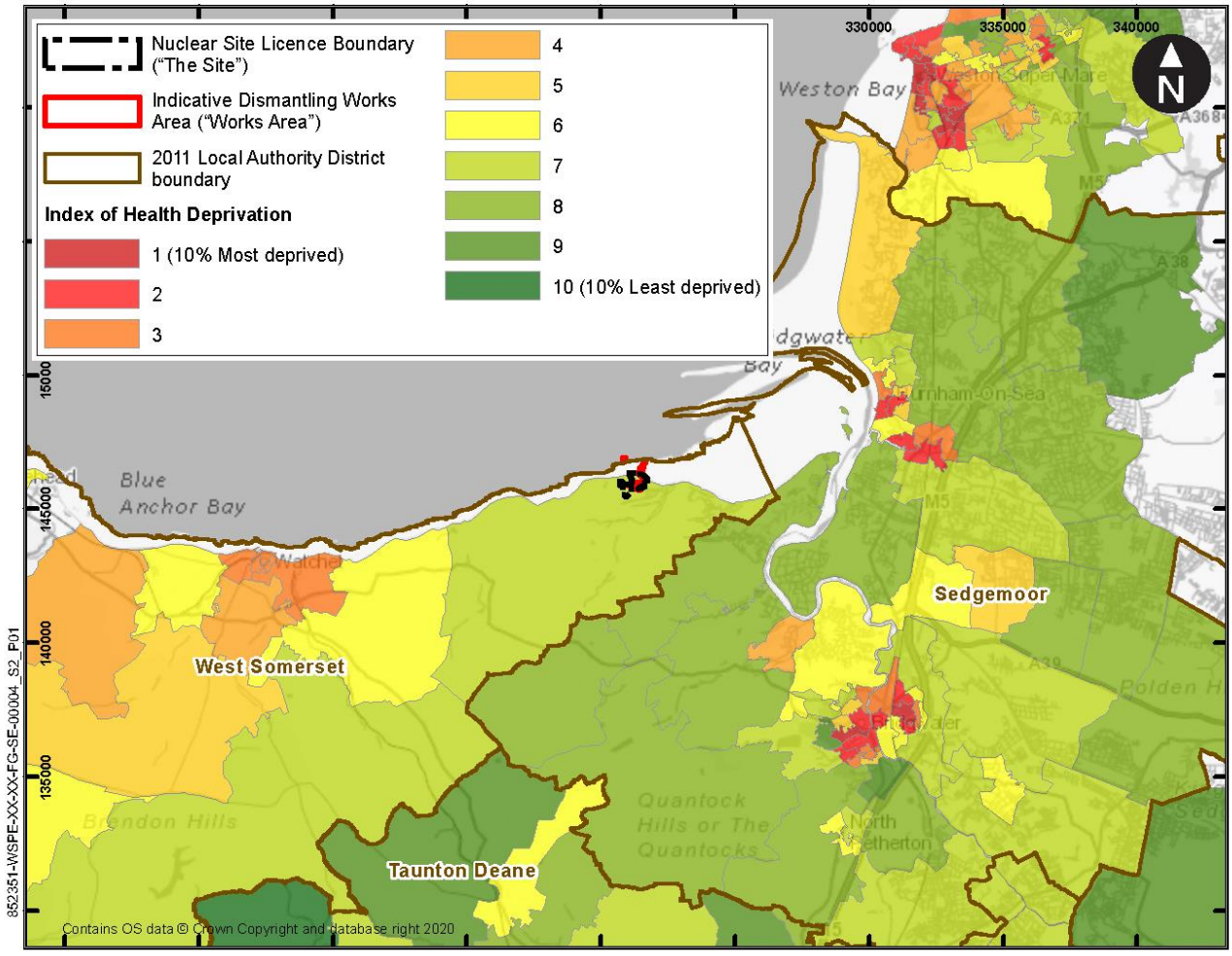


Health

17.5.15. The health domain of the Index of Multiple Deprivation (IMD) (see **Graphic 17-8**) reflects the general pattern for the IMD (See **Graphic 17-7**).

[23] X on **Graphic 17.7** denotes the location of HPB

Graphic 17-8 The health deprivation domain of the IMD for the area of the Three Districts near HPB



17.5.16. The 2021 Census for Somerset West and Taunton[24], shows that the overall health of the population is above national levels with 82.9% of residents describing their health as 'very good' or 'good', which is 1.2% higher than the England and South West levels of 81.7% and 82.8% respectively. In Sedgemoor[25], this figure is consistent with national levels, at 81.7%, but below South West level by 1.1% (See **Table 17-14**).

[24] ONS (2023). Somerset West and Taunton 2021. (Online). Available at: How life has changed in Somerset West and Taunton: Census 2021 (ons.gov.uk) (Accessed August 2024)
[25] ONS (2023). Sedgemoor Census 2021. (Online). Available at: How life has changed in Sedgemoor: Census 2021 (ons.gov.uk) (Accessed August 2024)

Table 17-14 Comparative Health Status

Health Status	Somerset West and Taunton (%)	Sedgemoor (%)	South West (%)	England (%)
Total	100	100	100	100
Very good	48.4	46.3	48.7	47.5
Good	34.5	35.4	34.1	34.2
Fair	12.5	13.1	12.5	13.0
Bad	3.7	4.0	3.7	4.1
Very bad	0.9	1.1	1.1	1.2

17.5.17. In Somerset West and Taunton, life expectancy at birth for males is 80.02 and females is 83.8, a level which is higher than the national averages of 79.3 and 83.1 respectively[26]. In Sedgemoor, life expectancy at birth for males is 79.2 and females is 83.3, which is also higher than the national averages of 78.9 and 82.8 respectively.

Public Health Services

17.5.18. As of 2023, across Somerset and within the Somerset Clinical Commissioning Group (CCG), there are 81 General Practitioner (GP) practices, two NHS Hospital Trusts, 17 NHS community hospitals, 100 pharmacies, 39 NHS opticians, 67 NHS dentists and 389 Care homes with Nursing[27].

17.5.19. Within Somerset West and Taunton, there are five GP surgeries and Sedgemoor has nine GP surgeries. Somerset has 1,720 patients per GP, but the national average is higher being 2,217 patients per GP. This indicates that there is currently not a high pressure on GPs in Somerset compared to the national average. However, it is noted that there is an aging population in the area which may require increase demand for GP services.

[26] ONS (2023). Health and Life Expectancies (Online). Available at: https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/healthandlifeexpectancies/datasets/lifeexpectancyforlocalareasinenglandnorthernirelandandwalesbetween2001to2003and2020to2022 (Accessed August 2024)

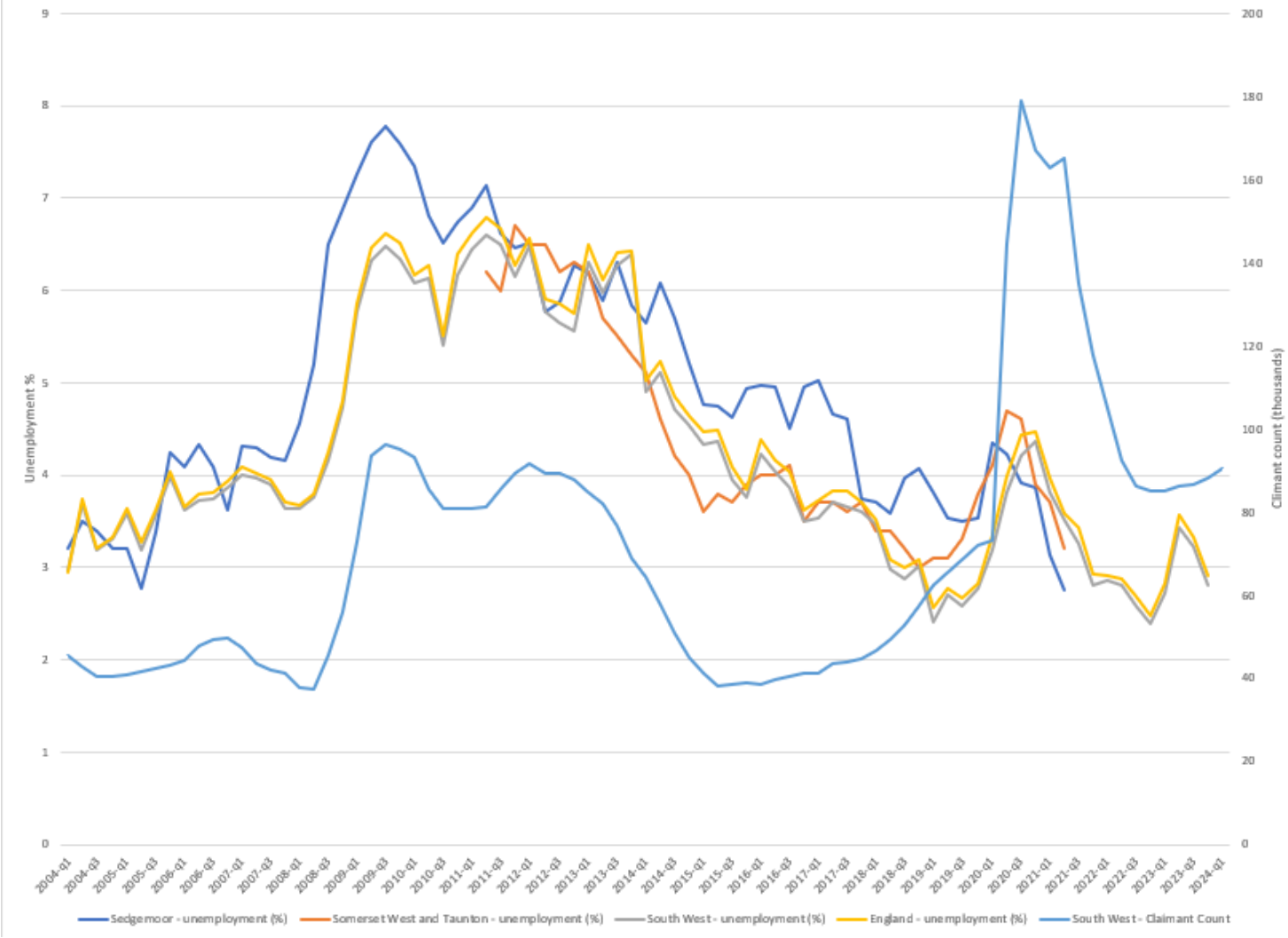
[27] Somerset Intelligence (2023). Somerset Facts & Figures. (Online). Available at: Somerset: Facts & Figures - Somerset Intelligence - The home of information and insight on and for Somerset - Run by a partnership of public sector organisations (Accessed August 2024)

Unemployment

17.5.20. The trend in unemployment in Sedgemoor and Somerset West and Taunton follows trends in the South West and England as shown in the dark blue, orange, grey and yellow lines respectively in **Graphic 17.9**[28]. The claimant count is also shown for the South West by the light blue line, and while it shows broad similarity with unemployment in the early period, it diverges significantly after 2015.

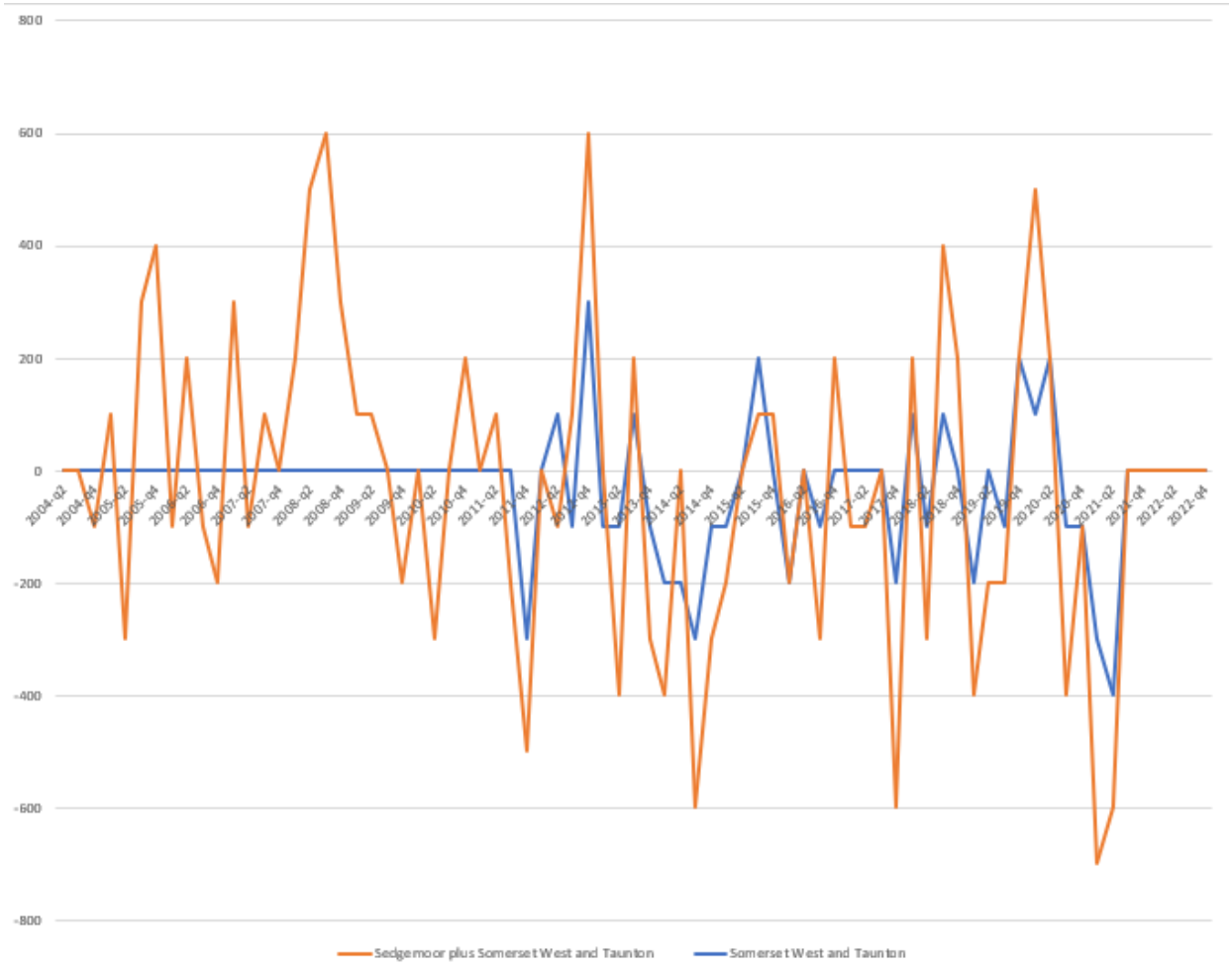
[28] Note that not all data series are available for the whole period.

Graphic 17.9 Unemployment and Claimant Counts in Sedgemoor, Somerset West and Taunton, the South West and England (2004-2024)



17.5.21. The change in unemployment from quarter to quarter in Sedgemoor and Somerset West and Taunton is shown in **Graphic 17.10**. The orange line shows the aggregate change and the blue line the change for Sedgemoor only. In the early period data is not available for Somerset West and Taunton, so the aggregate (orange) line just shows the smaller changes for Sedgemoor. The greatest increase in employment over one quarter is 600 people and the greatest decrease approximately 700 people. For the 39 quarters of data for both council areas ('Three Districts'), 26 show changes of more than 200 people, 17 with a decrease in unemployment and 9 with an increase.

Graphic 17.10 Quarterly change in Unemployment Sedgemoor and Somerset West and Taunton (2004-2024)



Tourist attractions

17.5.22. Somerset has a number of tourist attractions ranging from curated collections and fine gardens open to the public to wetlands and national parks. These comprise both the Quantock Hills Area of Outstanding Natural Beauty (AONB) and the Blackdown Hills AONB (see **Chapter 14: LVIA**). In the vicinity of the Site are a number of notable attractions, including:

- The King Charles III England Coast Path, which runs to the north and east of the Site;
- Stogursey Castle, approximately 3.5 km to the south-west;
- Wildfowl and Wetlands Trust (WWT) Steart Marshes, approximately 5 km to the south-east;
- National Trust Coleridge Cottage, approximately 6 km to the south;
- Nether Stowey Castle, approximately 6 km to the south;
- The Walled Gardens of Cannington, approximately 8 km south-east;
- Kilve Beach, approximately 6.4 km to the west; and
- Quantock Hills AONB, approximately 7 km south-west and 5.7 km west.

17.5.23. There are national trails and walking routes in the vicinity of the Site, including the King Charles III England Coast Path.

17.5.24. Within 3 km of the Works Area, there are four holiday rental properties on Booking.com[29], situated in Stolford, Wick, Shurton and Stogursey and one campsite, also in Shurton.

Public Rights of Way

17.5.25. The Public Rights of Way (PRoW) in the geographic area near the Site are shown in **Figure 16.5: Public Rights of Way (PRoW) in the vicinity of the study area** (with further detail provided in **Chapter 16: Traffic and Transport**). There are existing PRoW which lie directly to the north and south of the Site.

[29] Booking.com (2024). Booking.com: Hotels in Stolford. Book your hotel now! (Accessed August 2024)

The influence of Hinkley Point B within the local economy

17.5.26. HPB has provided long standing and high value employment opportunities within the local and regional area and is a valuable economic asset for the region. It is one of the large employers in the Three Districts. As of 31 December 2023, the workforce was 453 employees and is taken as the existing level at the time of writing, which represents 0.33%[30] of the economically active workforce in the Three Districts. Approximately 66% of the workforce have 10+ years' service at the Site and almost 90% are resident within areas with TA (Taunton) post codes. The breakdown of the workforce by age group is shown in **Table 17-15**.

Table 17-15 Age profile of HPB workforce (2023)

Age band	Percentage of workforce (%)
18 – 30	9
31 – 40	27
41 – 50	25
51 – 60	28
60+	10

Future baseline

17.5.27. England's population has grown since 2018 and projections anticipate a 10.3% increase in total population by 2043. In comparison, the rate of growth in the South West is higher, at 14.1%, and is similar to that in Sedgemoor (13.2%) and West Somerset (15.1%). Taunton Deane shows a significantly higher rate of 21.6%.

[30] Calculated against the total number of individuals employed across all sectors, as shown in **Table 17-9**.

Table 17-16 Projected population for Local Authority areas and Comparators (2018-2043)

Area	Population 2018	Projected Population 2027	Percentage Change (since 2018)	Projected Population 2033	Percentage Change (since 2018)	Projected Population 2043	Percentage Change (since 2018)
Sedgemoor	122,791	129,686	5.6	133,310	8.6	139,012	13.2
Taunton Deane	118,979	130,610	9.8	136,499	14.7	144,719	21.6
West Somerset	34,887	37,080	6.3	38,397	10.1	40,140	15.1
South West	5,599,735	5,949,488	6.2	6,131,583	9.5	6,387,785	14.1
England	55,977,178	58,527,723	4.6	59,792,005	6.8	61,744,098	10.3

17.5.28. The population of working age (16-67) has lower projected growth in all areas and in West Somerset sees a decline of 1.1% over the period from 2018 to 2043.

Table 17-17 Projected population of working Age (16-67) for Local Authority areas and Comparators (2018-2043)

Area	Population 2018	Projected Population 2027	Percentage Change (since 2018)	Projected Population 2033	Percentage Change (since 2018)	Projected Population 2043	Percentage Change (since 2018)
Sedgemoor	76,703	78,395	2.2	78,650	2.5	78,946	2.9
Taunton Deane	74,615	79,784	6.9	81,379	9.1	82,450	10.5
West Somerset	20,115	20,340	1.1	20,195	0.4	19,891	-1.1
South West	3,579,591	3,732,821	4.3	3,774,348	5.4	3,792,483	5.9
England	36,727,454	37,926,429	3.3	38,253,369	4.2	38,278,635	4.2

17.5.29. Somerset Council's recent assessment reported in the Recovery and Growth Plan and supporting Economic Somerset Economic Futures[8] assessment indicates change and growth in the energy, engineering and digital sector as important to the future of the area.

17.5.30. The proposed Gravity development[31] may provide significant employment in Bridgwater close to the area where many HPB staff currently live. The developer (Tata) is a major international company and the stated plans are:

- To build one of the largest factories in Europe, producing battery cells sufficient for 500,000 passenger vehicles and meeting half the demand from the UK automotive sector.
- Employment of 4,00 people directly with additional indirect employment in the supply chain.

17.5.31. A further significant component of the projected baseline are the forecasts for the nuclear power plant being built at Hinkley Point (commonly referred to as HPC). The changes in the workforce as construction periods are completed for HPC provide a context and reference for the changes at HPB. HPC also provides potential job opportunities in the area according to the skills required.

17.5.32. A projection of the effects of HPC, in terms of the changes it brings to employment is made below. It presents HPC forecasts as they have developed during the construction period with the primary objective of identifying the levels and timing of changes in HPC and the contribution they may make to the context for changes as it affects the Proposed Works.

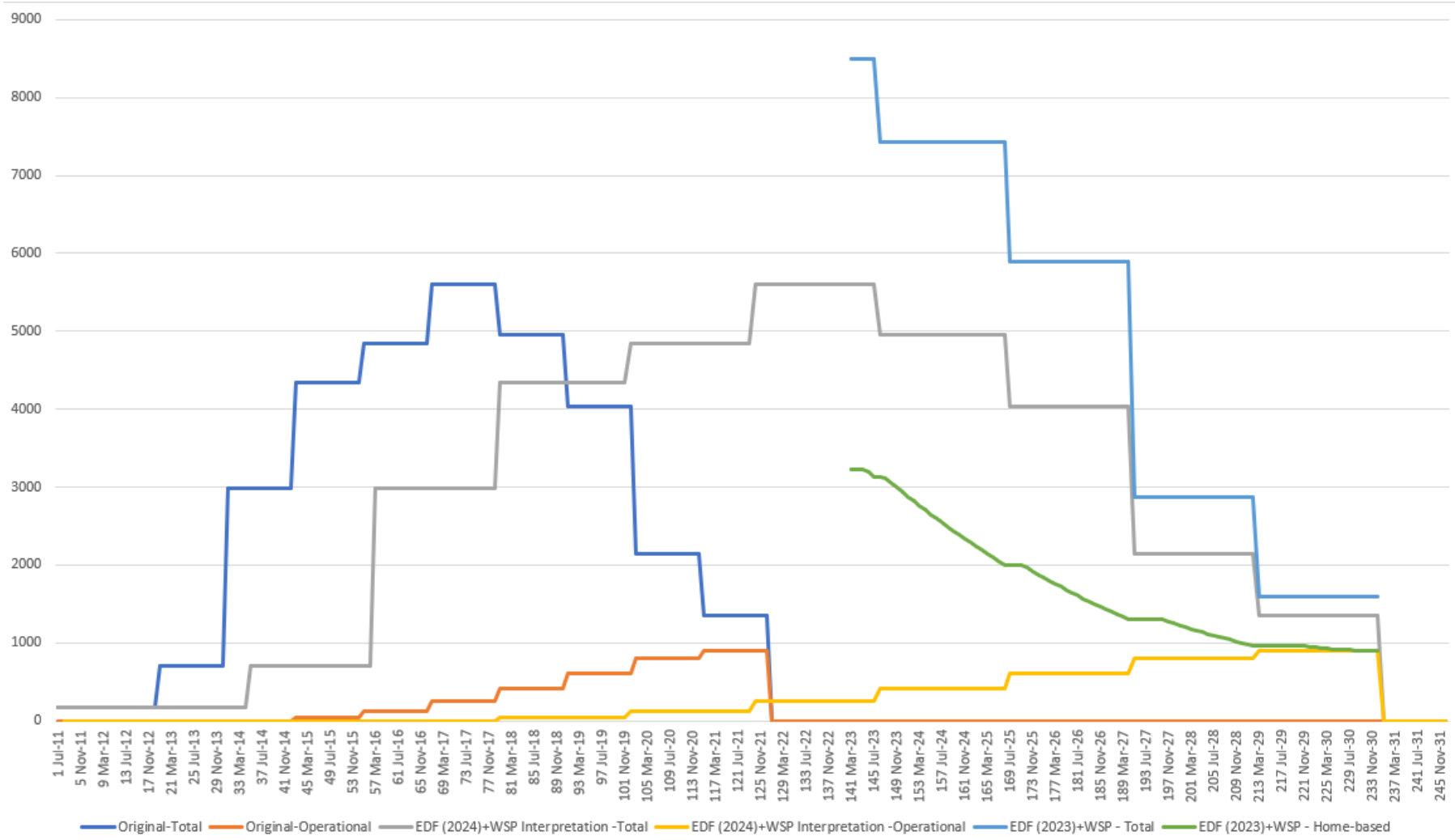
17.5.33. The original plan for HPC was for completion of construction by 2021, in advance of the Proposed Works (See **Graphic 17.11**). The graphic shows the original workforce requirement as the blue bell shape on the left with construction activities ending in 2021[32]. The similar, but extended bell shape in grey to the right shows a workforce plan based on more recent EDF public statements (January 2024) with a stated year of operation of the first of two generating units spanning the years between 2029 to 2031[33]. The graphic shows a middle scenario when construction is completed by 2030. The size of the two bell shapes (the area under each of them) indicates the labour resource required and assumed to scale pro-rata with costs. As the costs have risen by 80% from the £18bn estimated in

[31] BBC (28 February 2023). *Tata confirms Somerset will host £4bn battery factory* [online]. Available at: https://www.bbc.co.uk/news/uk-england-somerset-68412570 (Accessed August 2024).
[32] HPC, EN010001-005038-4.3 - Volume 2 - Hinkley Point C Development Site 1.pdf https://webarchive.nationalarchives.gov.uk/ukgwa/20190919184551mp_/https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010001/EN010001-005038-4.3%20-%20Volume%202%20-%20Hinkley%20Point%20C%20Development%20Site%201.pdf [Note that simplified numerical figures are provided in the ES although illustrations present more granular variation] (Accessed August 2024)
[33] EDF (2024). Hinkley Point C Press Release. (Online). Available at: https://www.edf.fr/sites/groupe/files/epresspack/7023/Hinkley-Point-C-PR-23012024.pdf (Accessed August 2024)

2015[34] to the £32.5bn estimated in 2024[35], the grey bell shape is constructed here by scaling the blue bell shape forwards in time, so the overall programme takes approximately 80% longer.

[34] https://www.theguardian.com/environment/2015/oct/21/hinkley-point-reactor-costs-rise-by-2bn-as-deal-confirmed (Accessed August 2024)
[35] https://www.edf.fr/sites/groupe/files/epresspack/7023/Hinkley-Point-C-PR-23012024.pdf [values are expressed in £2015 prices, and are the arithmetic average of the ranges quoted by EDF] (Accessed August 2024) https://www.edf.fr/sites/groupe/files/epresspack/7023/Hinkley-Point-C-PR-23012024.pdf [values are expressed in £2015 prices, and are the arithmetic average of the ranges quoted by EDF] (Accessed August 2024)

Graphic 17.11 Workforce profiles for HPC as published and estimated



17.5.34. Although the scaled workforce profile under the grey bell shape aligns with the budget and schedule as stated in January 2024, it does not match the peak workforce numbers reported by EDF in 2023 which are 8,500 in comparison to the originally planned peak of 5,600. This higher peak is shown on the graphic as the light blue line starting in 2023 and projected forward using a constant ratio with the levels in each step of the light blue line being in a ratio of 8500/5600 to the grey line. Because the light blue line is above the grey line, it implies additional resources (costs) which are not included within the £32.5bn. An 'alternative blue line' (not shown), which met the £32bn budget, while necessarily starting at the same current level of 8,500 would need to track below the grey line at some point to balance additional resources with future saved resources. This alternative light blue line is not shown but would have steeper falls than the line shown.

17.5.35. The planned operational workforce is shown for the original plan and the interpretation of the EDF 2024 statement, in orange and yellow respectively. The operational workforce climbs gradually to reach 900 employees in the original plan and is assumed to be the same in any future plan. The operational workforce would continue for the foreseeable future even though shown for simplicity on the graphic as ending with the construction period. The operational workforce is also included within the total workforce.

17.5.36. The number of home-based workers[36] at HPC who live in the surrounding area is shown (just from 2023 in line with the latest peak) by the green line. The initial number is 3,230, which is 38% of the peak workforce of 8,500. It is projected forward from 2023 by assuming that all the operational workforce, ultimately made up of 900 employees, is home based, and up to 38% of the total workforce is home-based.

17.6 Embedded environmental measures

17.6.1. A range of environmental measures have been embedded into the Proposed Works. Embedded measures relevant to the people and communities assessment are summarised in **Table 17-18.**

Table 17-18 Summary of Embedded Environmental Measures

Embedded Measure	Compliance Mechanism
The Applicant as part of its resource planning for decommissioning will: ● Undertake career aspirational discussions with staff; ● Offer contractual redundancy schedules; ● Assist workers with necessary retraining to facilitate suitability for decommissioning at HPB	Environmental Management Plan (EMP)

[36] Home-based workers produce goods or services in or near their homes for local, domestic or global markets.

roles or alternative roles within the Applicant organisation; • Specific collaboration with HPC on deployment opportunities; • Work with third-parties to advertise new opportunities for staff; and • Continue to support staff with post employment references for alternative posts.	
The NDA and NRS operate socio-economic programmes at each of their sites.	EMP
Stakeholder Engagement The Applicant will continue to be committed to engaging with stakeholders at all phases in the decommissioning process and will develop and implement a stakeholder communications plan as appropriate. In addition, the existing quarterly Site Stakeholder Group (SSG) meetings will continue to be utilised to provide an update on current site activities.	EMP

17.7 Assessment methodology

17.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: Approach to EIA,** and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this people and communities chapter, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the socio-economics assessment in the ES.

General approach

17.7.2. Decommissioning is intrinsic to the use of nuclear technology and a process for which operational sites make early plans. While decommissioning of HPB has long been anticipated, the exact timing of events has been subject to some uncertainty. The assessment reflects the adoption of a more defined timeframe albeit one that is to be a reasonable case (as set out in **Chapter 2: The Decommissioning Process**). Socio-economic impacts are differently influenced by the increased certainty of the decommissioning process and the following are distinguished in the assessment of effects:

- Human receptors which would always have been expected to be affected by the effects of decommissioning at some point but did not know when it would occur, such as the local council and the local economy; and
- Human receptors which are affected by decommissioning principally as a result of the specific effects of its timing, such as a worker near retirement.

17.7.3. In addition, the assessment takes into account:

- The different possibilities for receptors to mitigate effects; and
- The adoption of a cautious approach to the representation of effects.

Determination of significance

17.7.4. The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR) recognise that decommissioning will affect different environmental elements to differing degrees and that not all of these are of sufficient concern to warrant detailed investigation or assessment through the EIA process. The EIADR identifies those environmental resources that warrant investigation as those that are "*likely to be significantly affected by the Proposed Scheme*".

17.7.5. The EIADR does not define significance of an effect and it is necessary to state how this will be defined for the EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the importance of a receptor(s) and the magnitude of the change upon such a receptor(s).

17.7.6. With respect to socio-economics, there are no prescribed or established standards against which predicted effects of a proposed development can be assessed. Criteria are typically developed which are appropriate to the circumstances of the development and used to assess significance. The range of types of potential effects may require criteria specific to individual receptors and effects.

17.7.7. The sensitivity of a receptor describes the ability of the receptor to withstand or absorb change within the period of time the effect is expected to occur and without a fundamental change to its character or attributes. The sensitivity of these receptors may depend on their current and future characteristics as well as the nature of the effect, reflecting aspects such as:

- capacity and availability of community resources;
- previous experience of socio-economic change;
- vulnerability from pre-existing social circumstances or health conditions;
- cultural values, including public interest, perceptions towards a risk or potential change, and acceptability;
- environmental vulnerability of habitats important to the socio-economic context (such as degradation of a public park from increased use); and
- the direction, duration and reversibility of the specific impacts.

17.7.8. Criteria for levels of sensitivity are often qualitative because of the diversity of effects and need for subjectivity. With reference to precedents and consideration of local circumstances, the criteria in **Table 17-19** detail the basis for assessing receptor sensitivity for this assessment.

Table 17-19 - Establishing the sensitivity of receptors related to impacts on employment and the economy

Sensitivity	Criteria
High	The area has high levels of unemployment and overall deprivation (ranking in top 10%).
Medium	The area has above average levels of unemployment and above average deprivation (ranking in top 50%).
Low	The area has typical levels of unemployment and deprivation is less than average (ranking below 50%).
Very Low	No discernible change.

17.7.9. The magnitude of change can often be represented with quantitative indicators, such as employment opportunities resulting from the Proposed Works relative to a national average, but other effects may need a semi-quantitative or qualitative approach to account for variation in features such as:

- a more general concept of scale or extent (for example, number of groups and/or people, households or businesses affected; spatial area affected);
- the duration and frequency of effects and whether they are permanent or time-limited (short-term, medium-term or long-term);
- the direction of change and its reversibility; and
- the probability of occurrence.

17.7.10. Criteria for the magnitude of change are informed by local circumstances and features of developments. For employment effects, these include the mix of skills required, workforce demographic characteristics, and commuting distances. Although criteria for socio-economic analysis are often case-specific and qualitative, precedents exist for thresholds of magnitudes of employment and business effects used to assess developments in the power and nuclear sectors. With reference to these precedents and consideration of local circumstances, criteria within the ranges specified in **Table 17-16** and **Table 17-17** are considered relevant.

17.7.11. **Table 17-20** details the basis for assessing magnitude of change for effects related to employment.

17.7.12. **Table 17-21** details the basis for assessing magnitude of change for the wider economy.

Table 17-20 Establishing the magnitude of change for effects related to employment

Magnitude	Criteria for employment	Criteria for unemployment
Very High (*)	Change of more than 5% compared to baseline	Change of more than 10%, with associated impacts
High	Change of 2 – 5% compared to baseline	Change of 5-10% in claimant unemployed
Medium	Change of 1 – 2% compared to baseline	Change of 2.5 - 5% in claimant unemployed
Low	Change of 0.1 – 1% compared to baseline	Change of less than 2.5% in claimant unemployed
Very Low	No discernible change	No discernible change

Table 17-21 details the basis for assessing magnitude of change for effects related to expenditure and the wider economy.

Table 17-21 Establishing the magnitude of change for effects related to the wider economy

Magnitude	Criteria for effects related to the wider economy
High	Change of more than 2% compared to baseline
Medium	Change of 1-2% compared to baseline
Low	Change of less than 1% compared to baseline
Very Low	No discernible change

17.7.13. In line with the overarching methodology, the combination of sensitivity and magnitude of change is interpreted as a measure of the significance of effects as indicated in **Table 17-22**.

Table 17-22 Significance evaluation matrix

Sensitivity/importance/value	Magnitude of change: Very high	High	Medium	Low	Very low
High	Major (Significant)	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)
Medium	Major (Significant)	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)
Low	Major (Significant)	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)
Very Low	Moderate (Probably significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)	Negligible (Not significant)

17.8 Assumptions and limitations

17.8.1. Assumptions which affect the assessment of the magnitude of employment and related effects are specified and considered in context.

17.8.2. The future transfer of HPB to the NDA to be managed by their subsidiary Nuclear Restoration Services Ltd (NRS) does provide a level of uncertainty. It is therefore the assumption of this assessment that NRS will inherit and deliver decommissioning in-line with the description of the Proposed Works outlined in **Chapter 2: The Decommissioning Process**. This assessment assumes therefore that the workforce range assessed herein captures the worst-case scenario for employment change at the Site and subsequent impacts within the scope of this chapter.

17.8.3. A significant proportion of the UK workforce takes early retirement with the Liverpool Victoria Wealth and Wellbeing Monitor (a quarterly survey of 4,000 UK adults) reporting that 47% of retirees retired earlier than planned and that one in four retired at least five years earlier than planned[37]. Early retirement is not included in the assessment as information depends on the preferences of individual

[37] Liverpool Victoria (n.d). *Wealth and Wellbeing Monitor*. (Online) Available at: https://www.lvadviser.com/knowledge-centre/wealth-wellbeing-hub (Accessed August 2024).

workers but this could be expected to act to mitigate employment effects identified in **Section 17.10** below.

17.9 Scope of the assessment

Study area

17.9.1. Socio-economic impacts extend from the level of the impacts on individuals working at Site to the national economy. In general, the wider impacts are less likely to be significant as HPB activities comprise a small proportion of overall activity at the national level. Socio-economic effects at local level would arise through changes linked to changes in employment. The nuclear industry requires a skilled workforce and employees at HPB primarily live locally. While the existing workforce reduces through retirement and the effects of employee turnover over time, there are additional reductions required as a result of the changes in activities at the Site due to decommissioning.

17.9.2. The assessment focuses on the proportionate effects of employment assessed for the geographical areas identified in the Study Area defined for data gathering (**Section 17-3**), with a particular focus on the 'Three Districts' which has been used consistently in precedent analysis related to Hinkley Point. The effects at the level of the Three Districts also provide a reference for effects at a national level, on the basis that if a national level effect was concentrated on a small part of the nation (taken to be the Three Districts) and is assessed as insignificant, it can be excluded as a significant effect at national level.

Potential receptors

17.9.3. The potential receptors identified that were identified at the scoping stage were the following:

- People and communities in the area – who may experience a range of changes related to a resized and reskilled workforce and associated demographic changes. These include effects on public services, and requirements for housing, land and commercial services.
- Workers at the Site - who may experience a change in levels of demand for employment and/or a change in skills required reflecting the changing employment context associated with decommissioning. Employment markets relevant to workers at the Site – as the Proposed Works are likely to initiate a change in employment supply and demand from workers seeking new opportunities and from employers with new skills requirements.
- New businesses – which can potentially benefit from the skills and personnel made available by changes at the Site.
- Businesses in the supply chain for activities at the Site – who may experience changes in demand for services related to activities no longer required at the Site or to new activities required for the Proposed Works.
- Providers of education, training and transitional support services – who may see an increase in demand for reskilling and managing transition.
- Providers of public services – who may experience a change in level or type of demand associated with the changing workforce and demographics.
- The housing market – the net balance between existing workers who take up new opportunities elsewhere that may reduce demand for accommodation, and any demand for accommodation from incoming workers.

- The local economy – which will adjust to a new level of capacity and activity reflecting changes in demographics, employment and industry.
- Residents and visitors to the area – who may experience broader environmental impacts from new activities at the Site, such as arising indirectly from changes to commuting patterns or from change in the structure of local industry.

17.9.4. Impacts on residents and the level of local economic activity are expected to change according to the number of workers released from HPB with metrics for employment and the economy indicating the relative change in magnitudes of effects.

17.9.5. Environmental impacts on residents and visitors will depend on activities from the Proposed Works undertaken at and near the Site and are considered to be related to use of the King Charles III England Coast Path, owing to its proximity to the Site.

17.9.6. Receptors which are subject to the direct impacts of employment changes and activities near the Site and used in the assessment below of likely significant effects are summarised in **Table 17-23** together with the effects which are related and so are not separately assessed.

Table 17-23 Receptors Subject to Potential Effects

Receptor	Reason for Consideration	Related effects (*)
Employment Market	Travel to work data shows a local employment market based in Sedgemoor and Somerset West and Taunton where the main effects of HPB workforce changes are likely to occur.	Effects on people and communities in the area are expected to be proportional to impacts on the employment market and the local economy.
Workers at HPB	The decommissioning of HPB will affect individuals with roles related to earlier phases of operation and are no longer performed on the Site. The health of workers released may be affected.	
The local economy and businesses	The local economy will see effects related to changes in employment and purchasing in local markets; additional services will be required from the local markets; workers released from HPB will become available as part of the supply side of the local economy.	Effects on local supply chains, housing markets, business rates and council taxes are expected to be proportional to effects on the local economy. Effects on providers of education, training and transitional support services are expected to be proportional to effects on the employment market.
Walkers, cyclists and marine users near the Site	Activities at the Site, such as dust and noise emissions from the Works	Effects on these receptors are considered to also indicate the

Receptor	Reason for Consideration	Related effects (*)
	Area, may affect the health and wellbeing of onshore users such as walkers and cyclists using the King Charles III Coastal Path. The offshore elements of the Proposed Works may affect marine activities near the Site.	effects on residents and visitors (tourists) near the site. Effects on the health of onshore users near the Site. Effects on use of offshore and coastal areas and on provision of marine services.

(*) where applicable

Likely significant effects

17.9.7. The likely significant socio-economics effects that have been taken forward for assessment based on consideration of the Proposed Works and the Receptors subject to potential effects (from **Table 17-23**) are summarised in **Table 17-24**.

Table 17-24 Likely significant socio-economic effects

Activity	Likely significant effects	Receptors
Change in the activities undertaken at the Site and resulting changes affecting employment markets and the economy	Change in demand and supply of employment and skills available in the area from changes in requirements at the Site, with associated economic and health impacts	Employment markets; existing workers; local economy and businesses in the supply chain
Economic activity and business opportunities in the local area	Changes at the Site may initiate additional economic activity in the area with requirement for labour in existing local supply chains and potentially from new businesses	Employment markets; new businesses; local economy and businesses supplying decommissioning services
Activities within the Works Area may affect onshore and offshore users near the Site	Activities at the Site may affect access and amenity of users of onshore coastal resources such as the King Charles III England Coast Path near the Site and sea areas near the Site and their health.	Walkers, cyclists and marine users

17.10 Assessment of effects

17.10.1. A main indicator of socio-economic effects is the proportional change in employment levels as released HPB workers retire or look for work in local labour markets. People released may also experience further effects individually related to unemployment. The impacts on the economy are assessed in terms of its size at local, regional and national level, while socio-economic effects on recreational users are assessed for local residents and visitors using King Charles III England Coast Path.

17.10.2. The current workforce (December 2023) of 453 employees includes a range of occupations that could ultimately be employed across a multitude of sectors. This workforce is a small percentage (0.33%) of the working population of 137,500 economically active in Sedgemoor and Somerset West and Taunton and 2.6% of the 17,500 employees in the manufacturing and construction sectors.

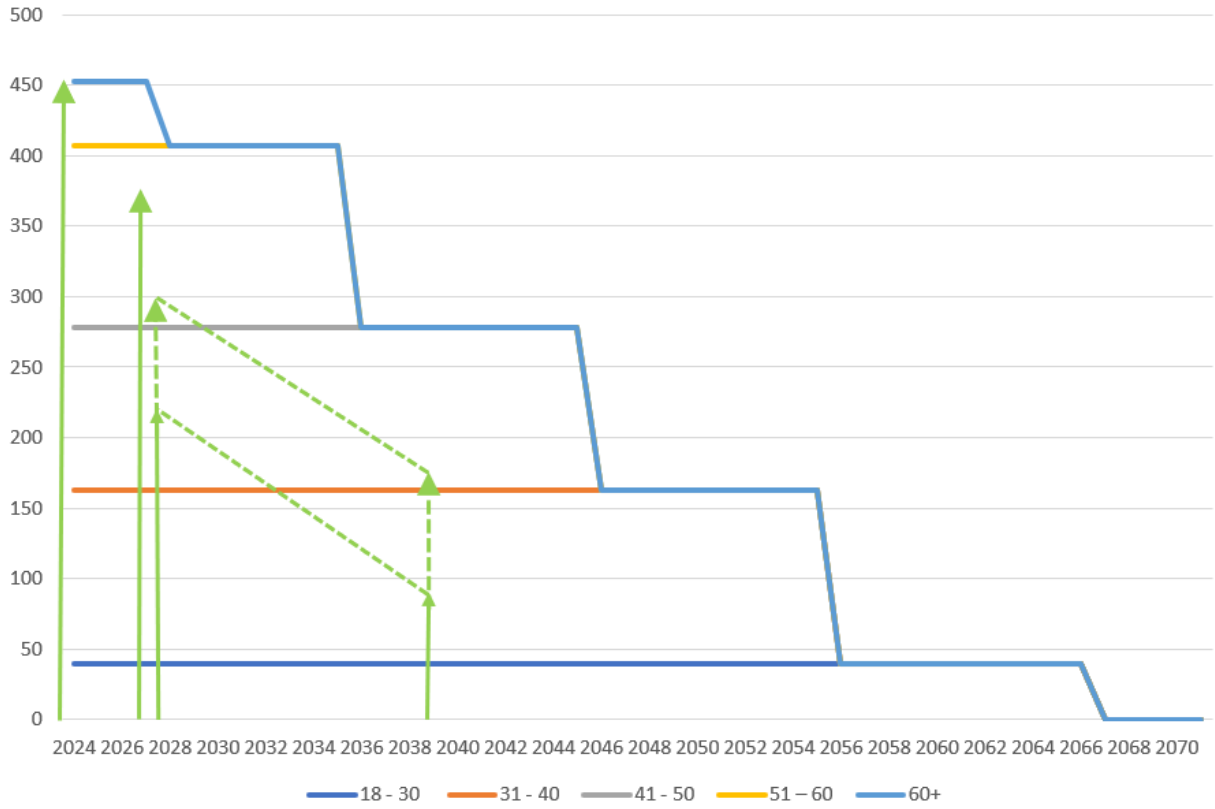
17.10.3. The Applicant expects that by 2026 the number of workers at HPB will reduce to approximately 373 with a corresponding 80 people (full time equivalent) released from employment compared to levels in 2024. After gradual reduction over the subsequent 12-13 years of the Preparations for Quiescence phase, a similar number are likely to be released in 2038 at the beginning the Quiescence phase, which is anticipated to take approximately 70 years with a negligible workforce requirement. A final phase of 10-12 years is planned for Final Site Clearance with similar activities to those of the Preparations for Quiescence phase and with likely slightly lower workforce requirements.

17.10.4. **Graphic 17.12** shows the age structure of the current workforce and the anticipated levels of future full-time employment at HPB. The employees aged 60+ retire first with the graph showing the corresponding fall of 46 employees from the current value of 453 employees to 407 in 2028, the year that the average member of this group (aged 60-67) retires. By 2026, just over a quarter of this group on average will have retired, reducing the workforce by approximately 13 employees. The subsequent falls reflect the retirement ages for the younger age groups in the current workforce, by 10-year age bands. The overall reduction would be more gradual than the graph which is based on the data available which specifies the average level for each age band.

17.10.5. The green arrows show anticipated workforce levels at the times of reductions in workforce, Currently the workforce is 453 employees (left hand arrow), in 2026, the level is 373 (2nd arrow) and then enters the period of gradual reduction from between 220-300 employees (dotted lines) which would reduce the workforce to 91-171 employees due to retirement which is shown by the step in the work force profile in 2035, but in fact would occur over a 10 year period. In 2106 there would be an increase of a similar magnitude followed by a final decrease neither of which are shown on the graph.

17.10.6. The current number of 453 employees as of the end of 2023 is planned to reduce to 220-300 shortly after 2026. As 13 of these would on average retire before 2026, there is a reduction required of 100-180 employees which occurs in 2026 and a similar reduction of 91-171 in 2038 when the workforce reduces to a minimal level for the Site in Quiescence. The assessment is based on two reductions of 100-180 in employee levels, one in 2026 and one in 2038.

Graphic 17.12 HPB workforce levels and effects of statutory retirement age



17.10.7. Assuming all workers intend to work until the statutory age for receiving a pension, 13 of those in the oldest age group (numbering 46) would retire before 2026 and so would be unaffected by the reduction in HPB workforce. The remaining 33 would retire within the next 4-5 years and, assuming they were economically active and wanted a job, would experience a maximum of between zero and 4-5 years of unemployment depending on their age of retiral, if they never worked again.

17.10.8. There are 129 employees in the next age band (51-60) who would all expect to retire over the next 10-year period with an average retirement date of 2035. As of 2024, this group has an expected future working life of between 7 to 17 years. This group of people is likely to have substantial experience and is the most likely to consider taking enhanced redundancy terms for early retirement or work offered through wider national or international specialist markets, according to personal circumstances.

17.10.9. The 60+ and 50-59 groups make up 175 employees over age 50 (46 + 129) and is a similar number to the planned workforce reduction of 100-180. The majority of these would be retired at the next planned workforce reduction in 2038 (latest in 2040) at which time the 115 people in the next 10-year age band (41-50) would have an expected future working life of between 3 to 13 years with a similar possibility of taking early retirement according to personal circumstances. The workforce reduction in 2038 would release all remaining employees, all with expected future working lives of more than 13 years.

17.10.10. It would be anticipated that over 53% of the existing workforce would be over 45 (based on the 2023 data outlined in **Table 17-15**) by 2026.

17.10.11. The assessment is based on the first period of workforce reduction, in 2026. It also provides an indication of the magnitude of the similar reduction in 2038 as well as of the minimum magnitude of the increase in employment for the phase of Final Site Clearance, though this too would also eventually end. Recognising their similarity, a change in the number of employees of 100-180 is used for the assessment of the magnitude of each of these impacts, with two reductions, in 2026 and 2038, an increase in 2106, and a final reduction in approximately 2116. The impact in 2026 is likely to represent a worst case amongst these because:

- It is nearest in time;
- Workforce plans for 2026 are dependent on already timetabled transitional agreements between organisations with dates which are unlikely to be changed to mitigate socio-economic impacts;
- Mitigating measures can be implemented only over the 2 years remaining before 2026 rather than over the longer periods that precede other phases; and
- While the overall project life for HPB was always known to require decommissioning at some date, the reduction by 2026 is the first future workforce reduction in the decommissioning plan after reactor defueling.

17.10.12. Successful mitigation of the impacts of the change in workforce numbers is expected to result in an outcome of shorter periods of unemployment for people released from HPB.

17.10.13. The Applicant is keen to assist staff and the local community in this transition to a decommissioning workforce. Enhanced redundancy terms will help to soften unemployment and also provide the opportunity for some staff to take early retirement. The Applicant is committed to helping staff undertake re-training where necessary to increase their suitability for roles within the HPB decommissioning staff or alternative roles located elsewhere within the Applicant's organisation. It will also work with third working parties to help identify and advertise new appropriate opportunities for departing staff.

17.10.14. Whilst the day-to-day management of the Site after transfer will be by NRS, the HPB site will become part of the NDA estate. The NDA and NRS operate socio-economic programmes at each of their sites and are therefore already familiar with the socio-economic challenges in the geographic area. There are NRS and NDA socio-economic schemes for more transformational projects which can see significant multi-year funding made available.

Effects on the employment market

Characteristics of local employment markets affecting resilience and sensitivity

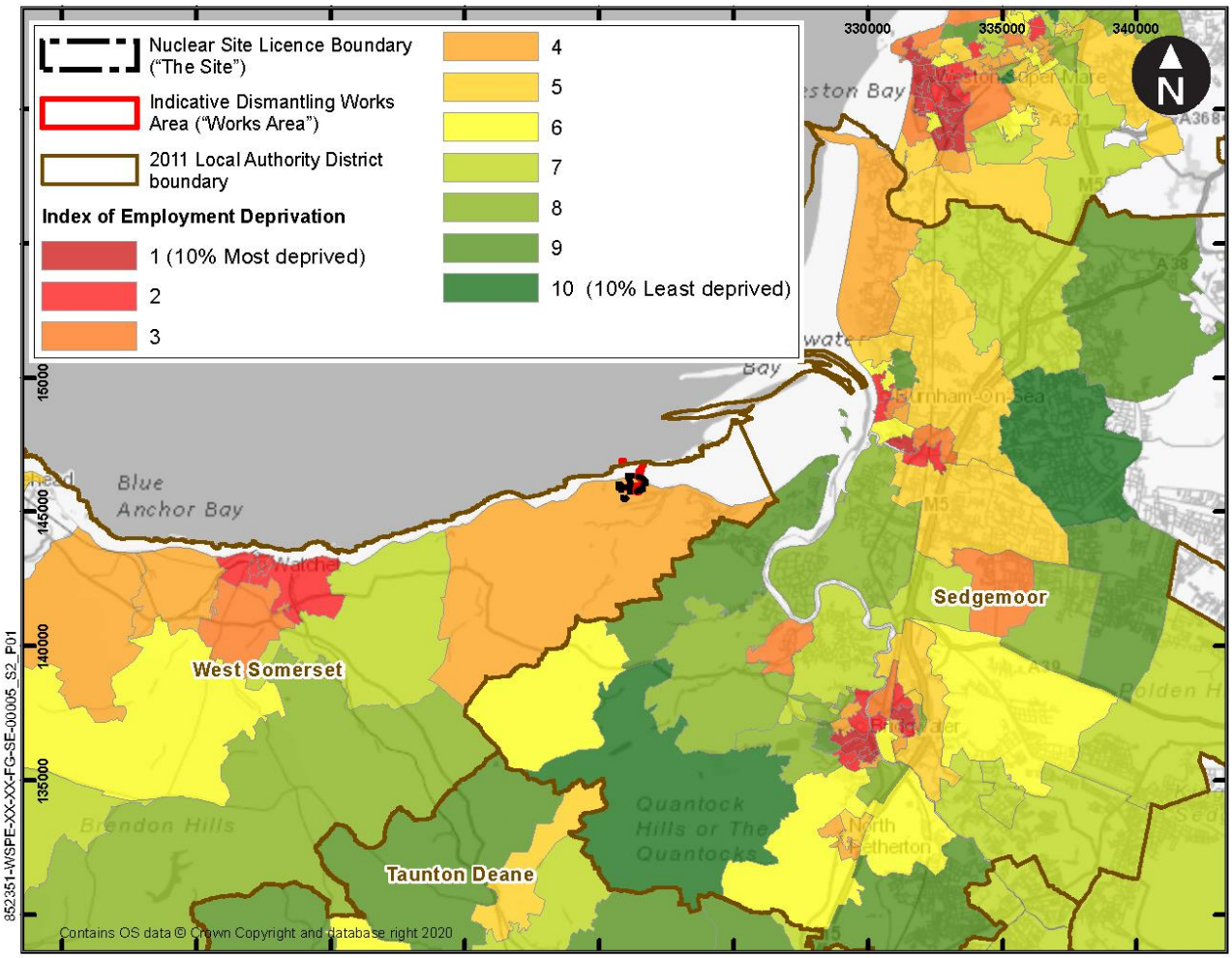
17.10.15. The travel to work baseline data indicates a significant number of workers commute to places of employment within the Three Districts with a pronounced peak for commuting distances to 15km. The area includes a number of rural areas, towns and wider conurbations and has a mixed economy with a structure which is broadly similar to the South West and Great Britain with a slight balance towards manufacturing and away from financial and professional services.

17.10.16. The levels of deprivation in the 'employment domain' of the IMD (See **Graphic 17.13**) show a tendency for areas of greater deprivation to be in towns and areas of less deprivation to be rural but overall, the area does not show extremes and reflects the average seen in the overall IMD scores.

17.10.17. The level of unemployment in Somerset West and Taunton and Sedgemoor most recently reported (see **Table 17-8**) was below the levels in the South West and England but was historically lower in Somerset West and Taunton and higher in Sedgemoor (see **Table 17-9**). Overall, the trend over time has been very similar at the local levels and at regional and national levels.

17.10.18. The ranking of the Three Districts in the upper 50% for IMD nationally leads to an assessment of the sensitivity of employment markets as **Medium** at the local level, and as **Low** at regional level (South West) and above in line with the criteria set at scoping and outlined in **Table 17-19**.

Graphic 17.13 The Employment deprivation domain of the IMD for the area of the Three Districts near HPB

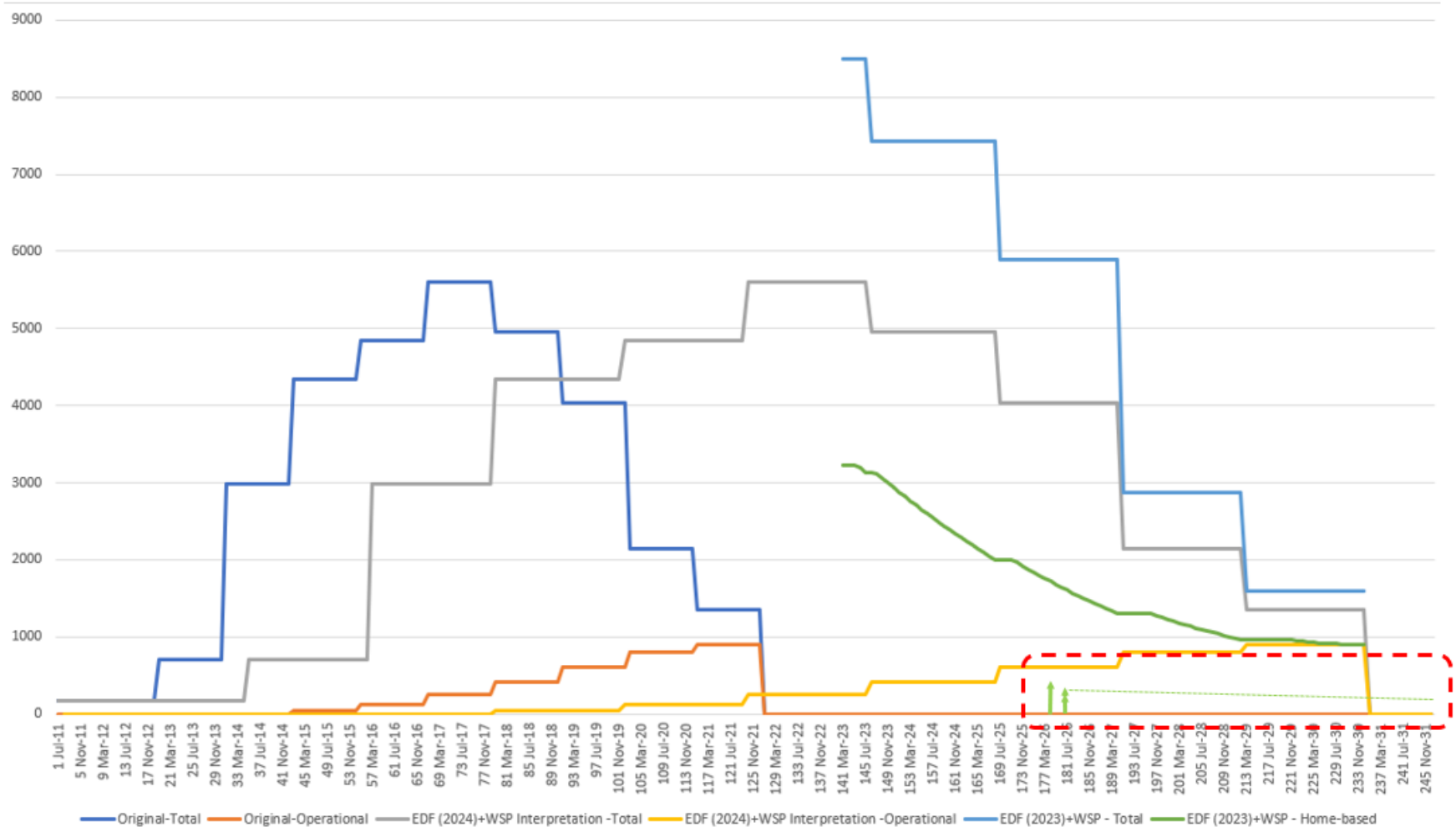


Changes in the local and regional employment market

17.10.19. Compared to the typical quarterly levels of change in employment, the potential reduction of 100-180 compares with an increase in unemployment of 200 people which has occurred on average almost once a year over a 10 year period. A quarterly change of more than 200 people (positive or negative) has occurred on average between two and three times a year. The trends in national, regional and local unemployment are presented in **Graphic 17.9**.

17.10.20. While these are historical comparisons, the future context for employment is significantly affected by the projected changes at HPC. The initial changes in workforce numbers at HPB (in 2026) are shown in a dotted red box as additions to **Graphic 17.14** showing the HPC projections. The green arrows show the anticipated level of employment at HPB with the dotted green line showing the reducing trend towards the level in 2038, although the second reduction in workforce (in 2038) is not shown, as it lies beyond the time period shown.

Graphic 17.14 Workforce profiles as estimated for HPC and HPB[33] [35]

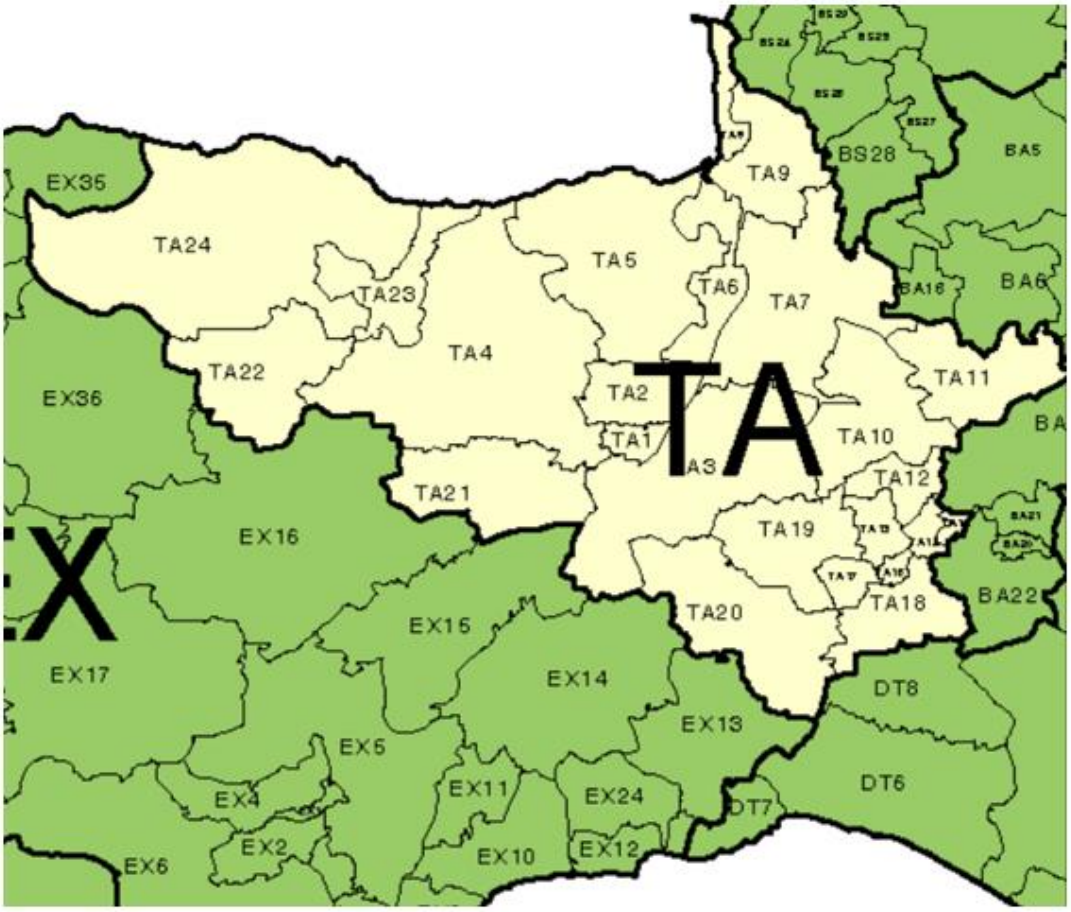


17.10.21. The first forward looking comparison is with the demand from HPC to support operations. While subject to the assumptions made above, operational employment at HPC is projected to grow from 600 people in 2026 to 900 in 2029, an increase of 300 people beginning with an increase of 100 people in 2026. The long service records of the majority of workers at HPB would include experience of HPB operational activities and they would be experienced applicants for roles at HPC.

17.10.22. The second comparison is with the HPC home-based construction workforce which is shown by the green solid green line in the graphic.

17.10.23. The HPB workers are home-based and live in a relatively concentrated geographical area (See **Graphic 17.15**). 88% of HPB workers live in Taunton postcode districts with over half of all workers living in just two districts (TA5 and TA6). HPC home-based workers are defined as resident within the much larger CDCZ area, within an employment area almost 10 times larger than the Three Districts and see a reduction based on the assumptions above from 1,600 people in July 2026 to 970 in July 2029, a reduction of approximately 200 people per year, equivalent to the reduction of 100-180 persons expected at HPB in 2026 (and later in 2038), but will be dispersed across a much wider area.

Graphic 17.15 Distribution of HPB workforce within local postcode districts



Postcode	workforce (%)
TA6	39%
TA5	17%
TA7	7%
TA1	5%
TA24	5%
TA23	4%
TA4	3%
TA2	3%
TA8	2%
TA3	1%
TA10	1%
TA21	1%
TA9	1%
total (TA)	*88%*
Others	*12%*

17.10.24. The significant levels of commuting as well as precedent analysis for HPC indicate that employment markets operate at the local Three Districts level. The potential reduction in workforce of 100-180 by 2026 amounts to between 0.07% and 0.13% of the economically active population in the Three

Districts. When compared with the criteria for employment in **Table 17.16**, the magnitude of change at the lower end of the range (0.07%) falls within the band for **Very Low** (a change below 0.1%). The magnitude of change at the upper end of the range (0.13%) falls just within the band for **'Low'** (0.1% to 1%). Overall, the magnitude of change at the local level is assessed as **Low**.

17.10.25. When compared with unemployment levels, change at the higher level of the range (180 staff) is 5.0% of the unemployment level in the Three Districts of approximately 3,600 (March 2022)[38]. These 3,600 people out of work correspond to an unemployment rate of 3.0% and an addition of 180 people would raise the rate to 3.1%. In the 10 years before 2021, the unemployment rate in the Three Districts reached 6.6% (at the time of the 2011 Census) corresponding to over 7,800 people out of work. Compared to this higher level of unemployment, 180 staff would make up 2.3%.

17.10.26. The range of between 2.3% and 5.0% (based on 180 workers) or a range of between 1.3% and 2.8% (based on 100 workers) indicates a magnitude of change compared to levels of unemployment which is between **Very Low** and **Medium**. While the high level of change (5.0%) in the worst case appears greater, it is based on comparison with a lower level of worklessness (of 3,600 people) and in fact indicates a more buoyant market and a greater likelihood of obtaining work.

17.10.27. At the regional South West level, where the population is approximately twenty times greater, the level of unemployment is 94,423 out of work[39] and of which an additional 180 people would result in a magnitude of change of 0.2% which is **Very Low** .

Indirect and induced employment effects

17.10.28. The effects assessed above are 'direct effects' on employment arising from the change in the staff directly employed by the Applicant. There are, in addition, 'indirect effects' arising from changes in employment in the supply chains for HPB products and services. A further category of 'induced effects' results from personal spending by HPB and supply chain workers from their salaries. The level of indirect and induced effects is commonly estimated using a factor (a 'multiplier') of the direct effects.

17.10.29. Multipliers for the nuclear industry near Hinkley Point have recently been used in analysis published by NRS (formally known as Magnox Ltd) in 2022 to appraise the effects of the 195 workers employed at HPA[40]. These provide the basis for the estimation of indirect and induced effects and, together with the direct effects, of a total effect. The multipliers used for HPA are considered appropriate for use in assessing the effects of HPB as they represent the same geographic areas and cover similar activities.

[38] Local government reorganisation means later data is not available at the level of the Three Districts.
[39] ONS (2024). *Labour market in the regions of the UK: April 2024.* (Online). Available at: https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/regionallabourmarket/april2024 (Accessed August 2024).
[40] Magnox Ltd (2022). *Magnox Economic Impact Assessment*. (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1106369/Magnox_economic_impact_assessment_2022.pdf (Accessed August 2024).

17.10.30. Using the multiplier of 1.7 applied by NRS for the total level of employment effects within the labour market of the local authority and those adjacent[41], the 180 potential employment reductions at HPB in 2026 and 2038 are also associated with 90 workers employed indirectly in the supply chain and 38 employed as a result of induced expenditure, to give a total of 308. While the 180 employees make up 0.13% of the economically active workforce in the Three Districts, the additional 128 employees make up an additional 0.09% to give a total of 0.22% of the Three Districts workforce being affected by the change in employment at the Site. In addition, new contracted employment is expected to be required at the Site. When compared to the criteria for employment (see **Table 17-20**), the total (including all direct, indirect and induced) effects are at a **Low** magnitude when compared to the local Three Districts labour market.

17.10.31. The nuclear industry uses capital-intensive specialised equipment and processes and does not require a large tonnage of fuel or other commodities. The supply chain used by HPB is predominantly based on the use of technical design and engineering services which are used more widely across the UK nuclear industry and are supplied in a national market. As such, the indirect supply chain effects from the changes at HPB are likely to be distributed and so will not have the same concentrated local impact as seen for the direct effects. Using the same multipliers as in the HPA analysis, the overall effect at national level is 737 employees, with 180 resulting from direct effects, 321 from indirect, and 236 from induced effects. These amount to negligible percentages at the national level. The difference in totals for the national impact of 737 employees and the impact in the Three Districts of 308 employees indicates that indirect supply chain and induced effects are not geographically concentrated in the same way as for direct effects.

17.10.32. The timetable for decommissioning and the expected effects are likely to have been clear to the companies and people working in the supply chain as the required expenditure programmes are decided appreciably in advance. The fuel (uranium) is purchased on timescales reflecting a fuel cycle which includes a known decommissioning plan and does not include recent orders. Operations and maintenance programmes are closely linked to the fuel cycle and have a similarly anticipated purchasing programme. These factors will reduce the effects in the supply chains. Additionally, HPB is part of a fleet of reactors in the UK. Five of these are still generating[42] with the earliest of these not anticipated to end generation until 2026 which will then be followed by a period of defueling, whilst the site at Dungeness B is at an earlier stage of defueling than HPB. Due to this anticipated demand, the supply chain for the UK nuclear industry is unlikely to be appreciably affected by the changes at HPB.

[41] Magnox Ltd (2022) includes specific reference to the use of a geographical area outside the LA boundary stating that "*As can be seen from the figures, for some sites, such as the case of Hinkley Point A, which is located at close proximity with an adjacent local authority district, the concentration of employees is higher in the adjacent local authority district (Sedgemoor) than the local authority district in which the site is located (Somerset West and Taunton)*".

[42] EDF (2024). UK Nuclear power stations. (Online). Available at: UK nuclear power stations | EDF (edfenergy.com) (Accessed August 2024)

Effects from change in use of contracted employment (contractors)

17.10.33. There is widespread use of contractors in the nuclear industry, primarily to meet specialised needs and shorter fixed term requirements. The socio-economic impact of contractors differs from full time employees, as it varies according to the type of work contracted. In general, the use of contractors provides additional employment at a particular site such as HPB, but the variety of work and skills required means that individual contractors are likely to be temporarily required and temporarily resident within the area local to the Site. Contractors at HPB will expect to be contracted for a finite period of work and then to look for work within a wider market. As this situation does not change with the changes at HPB, the effects on contractors currently working on contracts already agreed is considered to be immaterial and are considered negligible. There is an effect from the additional contracts which are required as a result of the decommissioning programme which is expected to increase the numbers of contractors on-site compared to the baseline dependent upon the proposed works on-site at given periods. This effect is not assessed quantitatively but considered to be substantially smaller than the direct effects and positive in adding to local employment opportunities. The overall effect on contractors is expected to reflect no change.

17.10.34. The magnitude of change for contracted employment is assessed as **Very Low**, as conditions are not anticipated to change substantially.

Summary of Effects on Employment Markets

17.10.35. Local labour markets exhibit regular levels of change in total employment which are of the same order of magnitude as the workforce reduction anticipated for HPB and the changes brought by the Proposed Works can be seen against this historic level as a reference. However, the local area is also projected to enter a period of significant future change due to the ending of construction and the startup of operations at the HPC power station, and the projected future development of the Agratas gigafactory within the Gravity Smart Campus.

17.10.36. The majority of construction employment at HPC is not home-based and the reduction in workforce is foreseen. The contracted non-home-based workforce have significant flexibility and the major changes in HPC employment are not expected to lead to a corresponding level of over-supply locally in this workforce. Nevertheless, the development of the battery factory is presumed to aim to benefit both the employer and the workforce by offering employment within the same area. In addition, the factory will require an operational workforce over the long term.

17.10.37. At the local level, the offsetting increases and decreases in the levels and types of economic activity in the energy and engineering sectors lead to a potentially complex evolution of employment markets, particularly in the local area. The changes in employment markets are also likely to be reflected in related socio-economic impacts, though it is in the interest of operators to manage transition effectively and this is likely to be enhanced by the geographical concentration of the major employers. Overall, the sensitivity of employment markets is assessed as **Medium** at the local level and as **Low** at regional level and above.

17.10.38. At the local level of the Three Districts, the fall in employment of 100-180 people at HPB compares in magnitude with the typical levels of changes in unemployment between quarters of 256 people[43]. Employees from HPB would be expected to have the skills and experience relevant to the increase in operational employment at HPC as well as at the Gravity battery factory. The reduction in employment is assessed as leading to effects with a **Low** magnitude of change.

17.10.39. At the level of the local Three Districts market, the effect is assessed as **adverse** and **Minor (Not Significant)**.

17.10.40. For the regional South West and national market, effects are considered as **adverse** and **Negligible (Not Significant)**. Including indirect and induced effects does not alter the assessment, primarily as they are not concentrated locally.

Effects on staff released from the HPB workforce

Characteristics of HPB staff affecting resilience and sensitivity

17.10.41. The HPB staff who are released are likely to have been in employment for an appreciable period and to have experienced stable residential and financial circumstances arising from the long-term planning and operations required in the nuclear sector. HPB workers have the skills and recent experience relevant to operational opportunities at HPC as well as access to a network of relationships including support through transition from the Applicant as outlined in **Table 17-18**. An appreciable proportion of the workforce are nearing retirement and national trends indicate that more workers are retiring earlier than the retirement age[44]. These aspects indicate that these workers have a higher than average level of resilience to a change in employment. The possibility for diversity in the experience of deprivation in the local area (See **Graphic 17.7**) may reduce aspects of this resilience and the overall sensitivity of HPB workers is assessed as **Medium**.

Economic effects on workers released from HPB

17.10.42. The opportunities for the workforce released from HPB depend on access to local and wider labour markets. The wider nuclear sector is expected to continue to require a sizeable workforce at HPC and at other locations in the UK and HPB employees would have skills and experience likely to be relevant if they chose to take up these opportunities.

17.10.43. On the assumption that the released employees would look for work within the local area and would not migrate, they would participate in the Three Districts and wider employment markets as assessed above. Workers at HPB are likely to have skills and suitability for a range of employment roles in the wider employment market across employment sectors such as:

- Managers, Directors & Senior Officials;

[43] See Graphic 17.10 Quarterly change in Unemployment Sedgemoor and Somerset West and Taunton (2004-2024)
[44] UK Parliament (2022). Economics Affairs News Article (Online). Available at: https://committees.parliament.uk/committee/175/economic-affairs-committee/news/175197/early-retirement-and-our-ageing-population-are-causing-labour-shortages-says-lords-report/ (Accessed August 2024)

- Associate Professional & Technical;
- Administrative & Secretarial;
- Skilled Trades Occupations; and
- Process Plant & Machine Operatives.

17.10.44. Whilst availability of these types of roles in the Three Districts and the wider 90-minute commuting zone has not been analysed for this assessment, the baseline data presented in **Section 17.5** does not indicate a significant lack of these types of roles compared to the national average. This indicates that there will be general availability of roles suitable for HPB workers who have left employment at the Site, via natural employment churn.

17.10.45. The Applicant has implemented a programme of career aspiration meetings with staff in recent years to address employment prospects in the longer term in the wider market and transitional career pathways to work as HPB decommissioning staff, along with supporting training requirements.

17.10.46. Taking into account the range of determinants and possible personal alternatives, the magnitude of change for economic effects on released workers is assessed as **Medium**.

Effects on health of workers released from HPB

The Proposed Works would not impact on the ability to access health services within the area, as there will be no change to population or impact on facilities.

The relationships between health and work are referenced across multiple government documents and the supporting evidence base[45]. They cover both the effect of ill-health on employment prospects and the effect of employment on health.

The sources of evidence are often based on the link between ill-health and indices of deprivation calculated locally for geographic areas. As such they represent the general characteristics of the area rather than specific groups of individuals within that area (See **Graphic 17-8**). Also, the more specific research is often focused on the characteristics of existing out-of-work groups rather than on the effects on groups currently in-work.

The health effects of unemployment have been academically assessed with a wide range of research perspectives and summaries[46]. One reference specifically identifies key determinants as being the duration for which an individual is out of work and the period between the unemployment and the onset of related health conditions[47].

[45] For example, see: Public Health England (2019). *Health matters: health and work* (Online) Available at: https://www.gov.uk/government/publications/health-matters-health-and-work/health-matters-health-and-work (Accessed August 2024).
[46] The Health Foundation. *Employment and unemployment: how does work affect our health?* (Online) Available at: https://www.health.org.uk/news-and-comment/charts-and-infographics/unemployment (Accessed August 2024).
[47] Forbes, J & McGregor, A (1984) *Unemployment and mortality in post-war Scotland* (Online) Available at: https://www.sciencedirect.com/science/article/abs/pii/0167629684900134 (Accessed August 2024).

17.10.47. Ischaemic heart disease is specifically quoted as related to employment and levels for this condition are higher than regional and national comparators for men and women. There are no statistics available at a local level in relation to ischaemic heart disease, however **Table 17-25** and **Table 17-26**[48] present national and regional statistics of the number of deaths registered which has been linked to ischaemic heart diseases. However, for the number of deaths registered due to ischaemic heart diseases in England in 2019, the most common underlying cause of death for males where ischaemic heart disease were a contributory factor on the death certificate was chronic lower respiratory diseases whereas for females, the most common underlying cause where ischaemic heart diseases were mentioned on the death certificate was dementia and Alzheimer's disease.

Table 17-25 Number of deaths registered linked to ischaemic heart diseases and age-standardised mortality rates in England

Year	Number of deaths	Rate per 100, 000 population
2013	59,280	123.0
2014	56,364	114.1
2015	56,493	112.8
2016	53,668	105.2
2017	53,852	103.7
2018	51,989	98.5
2019	51,141	94.7

[48] Office for National Statistics (2021). Ischaemic heart diseases deaths including comorbidities, England and Wales - Office for National Statistics (ons.gov.uk). (Accessed August 2024).

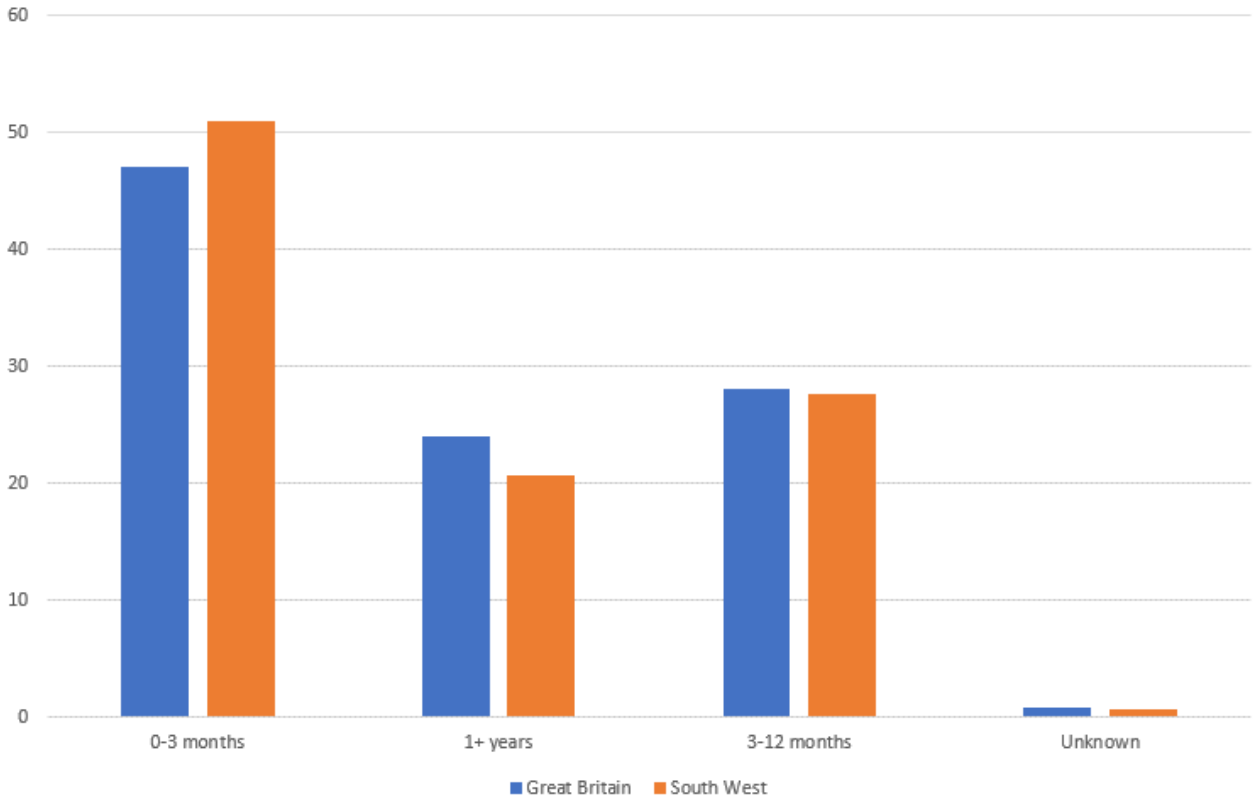
Table 17-26 Number of deaths registered all causes and those linked to ischaemic heart diseases and age-standardised mortality rates in South West

	All Causes		Ischaemic heart diseases	
Region	Number of deaths	Rate per 100, 000 population	Number of deaths	Rate per 100, 000 population
South-west	56,301	866.7	5,626	86.5

17.10.49. In the case of HPB staff, people over 50 years of age will have substantial experience relevant to work in wider national or international specialist markets, but are also in the group where personal circumstances may most allow early retirement. The effect is seen at national level where the employment rate for over 50s is 14.2% in 2023, below the rate for 35-49 year olds[49]. Statistics on the duration of periods of unemployment are only available at national and regional level. The South West shows durations of unemployment that are shorter than the Great Britain average with 50.9% of people out of work for periods less than 3 months, compared to 47.1% for Great Britain, while showing a lower proportion of people who are out of work for longer (See **Graphic 17.16**)[50].

[49] ONS (2023). *Economic labour market status of individuals aged 50 and over, trends over time: September 2023* (Online). Available at: https://www.gov.uk/government/statistics/economic-labour-market-status-of-individuals-aged-50-and-over-trends-over-time-september-2023/economic-labour-market-status-of-individuals-aged-50-and-over-trends-over-time-september-2023#:~:text=5.-,Employment,year%20to%2070.7%25%20in%202022 (Accessed August 2024).
[50] ONS (March 2024 Update). *Unemployment* (Online). Available at: https://www.ethnicity-facts-figures.service.gov.uk/work-pay-and-benefits/unemployment-and-economic-inactivity/unemployment/latest/ (Accessed August 2024).

Graphic 17.16 Duration of unemployment in the South West and Great Britain (2022)



17.10.50. These proportions may have significant variation at the detailed geographic level but provide a general indication that longer periods of unemployment are likely for an appreciably smaller proportion of affected workers. While being potentially older, HPB workers have experience and references which will enhance job prospects within the local market and are aligned with specific opportunities in the technology sector in the area, which are likely to lead to shorter periods out of work.

17.10.51. The effects on health are expected to be related to a period of unemployment for individuals which have also experienced stable and secure employment working at HPB. The Stevenson/Farmer review from UK government[51] identifies Employment and Support Allowance claims with mental health as the primary condition in the assessment of "*Lost output due to worklessness*".

17.10.52. While quantitative assessment is difficult, the physical health effects on workers released from HPB are expected to be limited as the period of unemployment is expected to be an interruption to a longer period of stable employment, which is beneficial to health rather than a long-term condition associated with poorer health overall. Effects on mental health are possible due to the known links

[51] UK Government (2017). *Thriving at Work: The Independent Review of Mental Health and Employers*. (Online) Available at: https://assets.publishing.service.gov.uk/media/5a82180e40f0b6230269acdb/thriving-at-work-stevenson-farmer-review.pdf (Accessed August 2024).(See Annex C: Analytical evidence and Methodology)

with worklessness but will vary according to the individual and their circumstances. The magnitude of change on the health of released workers and on the associated need for health service provision is assessed as **Low**.

Summary of effects on workers at HPB

17.10.53. The overall effect on workers at HPB recognises that the typical employee is likely to have experienced a quality of life that is better on average than many people living in the same communities and has skills and experience of high relevance to future opportunities at HPC and local markets. In addition, the falling trend in unemployment and the relatively accessible employment market indicate wider opportunities, however potential worklessness leads to challenges and increased vulnerability of employees who are released, particularly regarding mental health.

17.10.54. The conclusion is that the workers at HPB are a receptor with a sensitivity which is assessed as **Medium** and experience a magnitude of change relating to economic effects which is **Medium** and magnitude of change relating to health effects which is **Low**. The combined effects on workers at HPB are effects which are conservatively assessed as **Adverse** and **Moderate** (**Likely Significant**).

Effects on the local economy and businesses

Characteristics of the local economy and businesses affecting resilience and sensitivity

17.10.55. From the perspective of the local economy, the Three Districts market is of appreciable size and diversity and has a population of over 283,000 people. The long-term planning required in the nuclear sector gives early indications to companies in the supply chain and informs business expectations leading to mitigation of overall economic effects.

17.10.56. The local economy is conservatively assessed as of **Medium** sensitivity primarily as a result of the conditions of change arising from the HPC development and the potential for reduced economic activity with the ending of the construction period (See **Graphic 17.11**).

Economic impacts

17.10.57. The main economic impacts are proportionate to changes in employment but result in an effect which is smaller in percentage terms because markets in which employees make purchases are larger than local employment markets.

17.10.58. The main impacts of the Proposed Works on the local economy are related to the participation of the workforce in the purchase of local goods and services and the participation of HPB through supply chain purchases. The housing market in Somerset shows a stable trend with growth in house prices at the local level (see **Graphic 17.5**) closely matching national averages, while the volume of sales currently averages approximately 800 properties per month (see **Graphic 17.6**). The population in the Three Districts make up approximately half that of Somerset, which would imply an annual total of over 4,700 transactions which substantially exceeds the volume of sales likely to be generated from the small proportion of the workers at HPB who may move away.

17.10.59. In general, a larger workforce contributes a greater economic effect (greater added value) to the economy with the effect scaling directly with the number of people in employment. These effects can be represented using a similar method as employment based on multipliers.

17.10.60. Because the economy includes purchases from individuals additional to the full-time employees used to assess direct and indirect employment effects (such as part time employees, retired people

and people receiving benefits), the effects on the economy, as a percentage change, will be at a lower overall level than the effects seen for employment.

17.10.61. Using the corresponding multipliers as used in the recent NRS work[40] the impact of the reduction of 180 employees at the Site leads to a direct effect on the economy in terms of gross value added (GVA) of approximately £11m, with indirect and induced effects of £7m at the Three Districts level and £30m at national level. The total GVA effect is £18m at the Three Districts level and £42m at national level.

17.10.62. Businesses that serve the personal requirements of employees will be partially subject to the same uncertainty as employees regarding the timescales for decommissioning but will also continue to meet the needs of residents regardless of their employment status.

17.10.63. Businesses in the supply chain for HPB which are established and are expecting to endure are likely to have anticipated the need to adjust to a change in HPB purchasing despite not knowing exactly when it would occur. However, as purchasing in the nuclear sector has to meet long term planning needs, suppliers are likely to have experienced advance indications of change which enhances their ability to plan for any effects.

Effect on local council business rates

17.10.64. Local authority receipts and spending form part of the local economy which is affected by changes in employment status of local residents as well as potentially by changes in local business rates.

17.10.65. The levels of council tax paid by employees and business rates are estimated in the work for NRS on HPA[40]. Council tax is not paid by people who are unemployed and this effect is valued as £61k (per year) for the 180 people released from HPB, assessed on a pro-rata basis to the effect estimated at HPA.

17.10.66. The level of business rates is established by the central government according to rateable values for non-domestic properties and is estimated as £232k for HPA based on the rateable value of £425k[52] and the current national non-domestic rate multiplier of 54.6p in the pound[53]. However, the reduction in local government receipts would be less than this as a proportion would continue to be paid reflecting the level of activity and use of the site. Furthermore, the local council would have expected decommissioning to lead to a reduction in revenues and is in a position to mitigate effects through contributing to the development of local business activity.

Summary of effects on local economy and businesses

17.10.67. The overall effects on local economy and businesses mainly follow from and are proportional to changes in employment, but occur within a market of an appreciably greater size while the long-term planning required in the nuclear sector gives early indications to companies in the supply chain and

[52] UK Government (2024). Business Rates (Online). Available at: https://www.tax.service.gov.uk/business-rates-find/valuations/start/1482039000 (Accessed August 2024)
[53] UK Government (2024). Confirmation of business rates multipliers and relief information (Online). Available at: https://www.gov.uk/government/publications/12024-confirmation-of-business-rates-multipliers-and-relief-information/12024-confirmation-of-business-rates-multipliers-and-relief-information (Accessed August 2024)

will mitigate overall economic effects. Similarly, the effects on local taxes are expected and understood by public bodies and other organisations. The development of HPC and the Gravity battery factory have the potential to have complementary effects to the changes anticipated at HPB and to contribute to greater overall activity within local markets in the Three Districts.

17.10.68. The changes at HPB are set within a context of appreciable change in the local economy and in the projected baseline, particularly as the transition from construction to operation at HPC means the contracted construction workforce and the associated personal expenditures reduce. In qualitative terms, the magnitude of change from the contribution of Proposed Works is likely to be seen as a small proportion of these other changes while the related effects on other parts of the local economy, such as the housing market and education and health services, are similarly likely to be seen as a small proportion of overall changes. In quantitative terms, the criteria for the wider economy indicates that the magnitude of change from the Proposed Works of 0.7% is less than 1% and indicates a **Low** level of change. The local economy is conservatively assessed as of **Medium** sensitivity, primarily as a result of the underlying conditions and potential for change.

17.10.69. The conclusion is that the Local Economy and Businesses are a receptor with a sensitivity which is assessed as **Medium** and experience a magnitude of change which is **Low** and results in **Minor (Not Significant)** effects.

Effects on walkers, cyclists and marine users near the Site

Characteristics affecting resilience and sensitivity of walkers, cyclists and marine users near the Site

17.10.70. The users of the Kings Charles III England Coast Path are an onshore receptor with appreciable sensitivity to activities at the Site, as the path forms part of a continuous long distance trail. The sensitivity of walkers and cyclists using the coast path near the Site is assessed as **High**. Marine users are offshore receptors with appreciable sensitivity to activities which take place in sea areas used for the Proposed Works.

Effects from activities on the Site

17.10.71. The onshore elements of the Proposed Works predominantly take place within the Site boundary, while the marine elements of the Proposed Works are to the seaward of the path.

17.10.72. Public access along the current route of the King Charles III England Coast Path near the Site will be maintained throughout all phases of the Proposed Works. The route of the path, which includes the West Somerset Coast Path and the related Public Rights of Way are currently temporarily diverted due to the construction at HPC. Currently, the sites of HPB and HPC lie between the path and the sea, and the route passes to the south of them. While the diversion is not welcomed by walkers[54], the remaining of the King Charles III England Coast Path will remain open and accessible for the duration of the Proposed Works and there will not be a change in the current temporary route or other effects as a result of the Proposed Works at HPB, with a foreman provided when necessary

[54] Olly Parry-Jones(2016). *Combwich to Lilstock* (Online). Available at: https://ollypj.wordpress.com/2016/05/05/combwich-to-lilstock-part-2/ (Accessed August 2024).

to ensure the safety of members of the public using the path. The magnitude of change is assessed to be of **Very Low**.

17.10.73. In this context, the wider effects of the Proposed Works associated with dust deposition are assessed on human and ecological receptors in **Chapter 6: Air Quality** and are concluded to be negligible with the application of standard mitigation measures, as included in the Environmental Management Plan (EMP). Similarly, the risk of increased accidents and increases in fear/intimidation of pedestrians, is outlined in **Chapter 16: Traffic and Transport** and concluded a Negligible (not significant) effect. **Chapter 15: Noise and Vibration** identifies that when good practice measures to control noise are implemented, no significant effects would be experienced by receptors in the vicinity of the Proposed Works.

17.10.74. The offshore elements of the Proposed Works are temporary and comprise a small part of the total programme of the Proposed Works at HPB. The activities may interact with other marine uses as identified in the Severn Estuary European Marine Site Management Scheme 2018-2023[55], which are identified as applicable by relevant authorities with responsibilities in the sea and coastal areas near HPB. To avoid and/or minimise the impact that these interactions may have, embedded measures as defined in paragraph 17.3.6, may apply as part of the Proposed Works.

17.10.75. The Scheme[55] covers a comprehensive list of marine activities undertaken across the Severn Estuary. Many of these are identified as unlikely to occur within the area of the Proposed Works while others are not within scope or are not relevant (e.g. events and festivals, or commercial fishing). Of the other activities, potential effects resulting from the Proposed Works are unlikely either because the sea area around HPB is small compared to the areas in which they may take place, or because the duration of Proposed Works is short in duration compared to the activities frequency. For example, marinas and boat clubs in the Severn Estuary study area for the scheme do not overlap with the Works Area, with the nearest being Combwich Motor Boat & Sailing Club off the River Parrett or Burnham-on-Sea (both over 6km from the Works Area) [56]. The magnitude of change is expected to be **Very Low**.

Summary of effects on walkers, cyclists and marine users near the Site

17.10.76. The walkers, cyclists and marine users are considered to be receptors with appreciable sensitivity but are ‘transitory’ receptors which will not experience the same magnitude of impact when compared with those at specific fixed locations and are unlikely to be inconvenienced by the Proposed Works due to the intention to maintain public access throughout and the adoption of relevant embedded environmental measures.

[55] Association of Severn Estuary Relevant Authorities (ASERA) (2018) *Severn Estuary European Marine Site Management Scheme 2018-2023* (Online). Available at: https://asera.org.uk/wp-content/uploads/sites/3/2018/05/Severn-Estuary-EMS-Management-Scheme-2018-2023-May-2018-2.pdf (Accessed August 2024)

[56] Association of Severn Estuary Relevant Authorities (ASERA) (2016) Recreational Boating in the Severn Estuary. Available at: Recreational Boating in the Severn Estuary (asera.org.uk). (Accessed August 2024)

17.10.77. The conclusion is that walkers, cyclists and marine users near the Site are receptors with a sensitivity which is assessed as High but will experience a magnitude of change which is **Very Low** and results in **Minor (not significant)** effects.

17.10.78. Users of the path could also be considered as receptors for potential health effects. As outlined in **Chapter 15: Noise and Vibration**, effects on receptors in proximity to the King Charles III Coast Path are assessed as Minor (not significant). Due to the transitory nature of the use of this path the magnitude of change in health to effects on users is considered **Very Low** and with a significance which is between **Minor and negligible** (for highly sensitive and other receptors respectively) and assessed as **Not Significant**.

17.11 Assessment of cumulative effects

Inter-Project Effects

17.11.1. There is the potential for people and community effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

17.11.2. An assessment inter-project effects is considered within in **Chapter: 21: Cumulative Effects Assessment** of this ES.

Intra-Project Effects

17.11.3. Effects including noise, air quality and landscape and visual have been considered inherently within the assessment of recreational facilities. Further assessment of intra-project effects on communities and residential receptors is provided in **Chapter 21 Cumulative Effects Assessment**.

17.12 Summary

Table 17-27 Summary

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
Employment Market	There are effects on employment in the Three Districts areas.	Local Level - Medium Regional Level and above - Low	Local Level - Medium Regional Level and above - Low	Local Level - Adverse and Minor (Not Significant) Regional Level and above - Adverse and Minor/Negligible (Not significant)	The HPB workforce predominantly lives within the Three Districts and local employment markets will see a transition with potential growth in demand for operational staff at HPC and at the Gravity battery factory. Negative impacts from loss of employment will occur in 2026 and 2038 during the phase “Preparations for Quiescence”, with positive impacts from new employment in 2106 for Final Site Clearance and a negative impact in 2116 at Project end.

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
Workers at HPB	Workers may experience variable periods of unemployment and associated mental health impacts, while some may take early retirement. Workers have skills likely to be relevant to growth in the Three Districts area.	Medium	Economic effects - Medium Health effects - Low	Adverse and Moderate (Likely Significant)	Employee household resilience and health is likely have benefited from stable employment. Employees are skilled and experienced and may have the option of early retirement according to personal circumstances.
The local economy and businesses	Economic impacts are closely aligned with changes in employment and occur at the same times in the Project phases.	Medium	Low	Minor (Not significant)	The Three Districts market is of appreciable size and diversity and economic agents have appreciable information about schedules and have time to plan for change.
Walkers, cyclists and marine users near the Site	Onshore, residents and visitors using the King Charles III England Coast Path will pass close to the Site throughout all phases.	High	Very Low	Minor (not significant)	Public access along the King Charles III Coast Path near the Site will be maintained along current routes throughout all phases. Offshore activities are in small and infrequently used

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
	Offshore, users of the sea area near the Site may experience effects from the marine activities of the project.				sea areas and can be mitigated.

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18

Major Accidents and Disasters

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18 Major Accidents and Disasters

18.1 Introduction

18.1.1. This chapter of the Environmental Statement (ES) assesses the likely significant effects of the Proposed Works arising from the potential for Major Accidents and Disasters (MA&D), and in the context of the Indicative Dismantling Works Area (hereafter referred to as 'the Works Area'). The chapter should be read in conjunction with the description of the Proposed Works presented in **Chapter 2: The Decommissioning Process**.

18.1.2. This chapter is supported by the following appendices provided in Volume III of this ES:

- **Appendix 18A: Major accident and disaster criteria for magnitude**
- **Appendix 18B: Impact assessment for scoped-in scenarios**

18.1.3. A Scoping Report was submitted to the ONR in October 2022 which included an assessment of the potential for significant effects arising from MA&D. This process evaluated and identified the scenarios which had the potential for significant effects, and set out the proposed methodology to assess them. The Scoping Report was reviewed by the ONR and other stakeholders, and in their Pre-Application Opinion (included in **Appendix 5A**), the ONR agreed to the proposed scope and approach for the completion of the Environmental Impact Assessment (EIA) and ES.

18.1.4. As Hinkley Point B Nuclear Power Station (HPB) is managed under strict regulatory regimes which will control almost all the activities in the Works Area, only a small number of potential effects and activities were scoped into the assessment. These relate to potential major accident or disaster scenarios which are outside of the scope of these regulatory regimes. It should be noted that all accidents involving radiological hazards are scoped out as they are regulated under the provisions of the Nuclear Site License and permitting regime, considered in **Chapter 20: Radioactive Waste and Discharges**. In addition, Hinkley Point B[1] has reduced its holdings of dangerous substances, meaning it is no longer subject to the Control of Major Accident Hazards Regulations 2015 (COMAH)[2].

18.1.5. The scopes in scenarios are (as set out in the Scoping Report):

- major accidents associated with the Proposed Works resulting from a fire/explosion and caused by accidental release of substances;
- major accidents associated with the Proposed Works resulting from an accidental release of a hazardous chemical;
- run-off of contaminated fire water from non-process/non-rad fire/explosion (e.g., building fires) associated with the Proposed Works;
- major accidents caused by physical effects associated with the Proposed Works (structural collapse, impact, dropped or swung load, high energy pipe/ equipment failure, collapse of excavation);

[1] ONR (2024) Hinkley Point B (Online) Available at: https://www.onr.org.uk/our-work/what-we-regulate/operational-power-stations/operational-sitesfacilites/hinkley-point-b/. (Accessed August 2024).
[2] ONR (2024) Hinkley Point B no longer under increased regulation for dangerous substances (Online). Available at: Hinkley Point B no longer under increased regulation for dangerous substances | Office for Nuclear Regulation (onr.org.uk). (Accessed August 2024).

- natural disasters (such as extreme weather) where the Proposed Works have a material effect on the extent and severity of the disaster; and
- major accidents caused by events external to the decommissioning where the Proposed Works have a material effect on the extent and severity of the accident. This includes aircraft crash, projectiles, domino effects from an industrial accident in the vicinity, and loss of key utility (power supply, water supply) etc., and this excludes security, cybersecurity and malicious acts[3].

18.2 Relevant legislation, policy and technical guidance

Legislation

18.2.1. The legislation in **Table 18-1** is relevant to the assessment of the effects on major accidents and disasters receptors:

Table 18-1 Legislation relevant to major accidents and disasters

Legislation	Legislation Issue
Health and Safety at Work (etc) Act 1974 (HSAW)[4] and regulations made thereunder including: ▪ Lifting Operations and Lifting Equipment Regulations 1998 (LOLER);[5] ▪ Provision and Use of Work Equipment Regulations 1998 (PUWER);[6] ▪ The Management of Health and Safety at Work Regulations 1999 (MHSAW);[7] ▪ The Control of Substances Hazardous to Health Regulations 2002 (COSHH);[8] ▪ The Dangerous Substances and Explosive Atmospheres Regulations (DSEAR) 2002;[9] ▪ The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009;[10]	HSAW and the associated regulations represent the baseline regulatory environment for workplace activities. Together they form the regulatory requirements for workplace Health, Safety and Security in the UK nuclear industry. These requirements drive the baseline standards for good practice and mitigation.

[3] Malicious acts are deliberate actions taken with deliberate intent to cause damage or with reckless disregard for the potential consequences of those actions which would cause damage or harm to people, assets or the environment. It is intended to capture terrorism, vandalism, theft, sabotage and other forms of criminal damage.
[4] UK Government (1974). Health and Safety at Work etc. Act 1974 (SI 1974/C.37) (Online). Available at: http://www.legislation.gov.uk/ukpga/1974/37/contents (Accessed August 2024).
[5] UK Government (1998). The Lifting Operations and Lifting Equipment Regulations 1998 (SI 1998/C.66). (Online). Available at: http://www.legislation.gov.uk/uksi/1998/2307/contents/made (Accessed August 2024).
[6] UK Government (1998). The Provision and Use of Work Equipment Regulations 1998 (SI 1998/2306). (Online). Available at: http://www.legislation.gov.uk/uksi/1998/2306/contents/made (Accessed August 2024).
[7] UK Government (1999). The Management of Health and Safety at Work Regulations 1999 (SI 1999/3242). (online). Available at: http://www.legislation.gov.uk/uksi/1999/3242/contents/made (Accessed August 2024).
[8] UK Government (2002). The Control of Substances Hazardous to Health Regulations 2002 (SI 2002/2677). (Online). Available at: http://www.legislation.gov.uk/uksi/2002/2677/contents Accessed August 2024).
[9] UK Government (2002). The Dangerous Substances and Explosive Atmospheres Regulations 2002 (SI 2002/2776). (Online). Available at: http://www.legislation.gov.uk/uksi/2002/2776/contents (Accessed August 2024).
[10] UK Government (2009). The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations 2009. (Online). Available at: https://www.legislation.gov.uk/uksi/2009/1348/contents/made (Accessed August 2024).

Legislation	Legislation Issue
▪ The Control of Major Accident Hazards (COMAH) Regulations 2015;[11] ▪ The Construction (Design and Management) Regulations 2015 (CDM);[12] ▪ Nuclear Industries Security Regulations 2003 (as amended 2017);[13] ▪ The Ionising Radiation Regulations 2017 (IRR);[14] ▪ The Carriage of Dangerous Goods (Amendment) Regulations 2019 (CDG19)[15]; and ▪ The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (REPPIR19)[16].	
The Nuclear Installations Act 1965 (as amended)[17] (NIA)	The NIA provides the nuclear site licensing regime which requires operators to comply with various license conditions as set by Office for Nuclear Regulation (ONR).
Civil Contingencies Act 2004 (CCA)[18] and The Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005[19]	The CCA and associated regulations provide the requirements for emergency responders to have appropriate risk assessments and contingency plans for foreseeable emergency scenarios in their area including MA&Ds.
The Regulatory Reform (Fire Safety) Order 2005[20] and The Fire Safety (England) Regulations 2022[21]	These items form the requirements for building fire safety in England. They represent the baseline

[11] UK Government (2015). The Control of Major Accident Hazards Regulations 2015. (Online) Available at: https://www.legislation.gov.uk/uksi/2015/483/contents/made (Accessed August 2024).
[12] UK Government (2015). The Construction (Design and Management) Regulations 2015 (SI 2015/51). (Online). Available at: http://www.legislation.gov.uk/uksi/2015/51/contents (Accessed August 2024).
[13] UK Government (2003). The Nuclear Industries Security Regulations 2003. Online). Available at http://www.legislation.gov.uk/uksi/2003/403/contents/made (Accessed August 2024).
[14] UK Government (2017). The Ionising Radiation Regulations 2017 (SI 2017/1075). (Online). Available at: http://www.legislation.gov.uk/uksi/2017/1075/contents (Accessed August 2024).
[15] UK Government (2019). The Carriage of Dangerous Goods (Amendment) Regulations 2019 (SI 2019/598). (Online). Available at: http://www.legislation.gov.uk/uksi/2019/598/contents/made (Accessed August 2024).
[16] UK Government (2019). The Radiation (Emergency Preparedness and Public information) Regulations 2019 (SI 2019/703). (Online). Available at: http://www.legislation.gov.uk/uksi/2019/703/contents/made (Accessed August 2024).
[17] UK Government (1965). The Nuclear Installations Act 1965 (SI 1965/c.57). (Online). Available at: https://www.legislation.gov.uk/ukpga/1965/57/contents (Accessed August 2024).
[18] UK Government (2004). Civil Contingencies Act 2004 (SI 2004/c.36). (Online). Available at: http://www.legislation.gov.uk/ukpga/2004/36/contents (Accessed August 2024).
[19] UK Government (2005). The Civil Contingencies Act 2004 (Contingency Planning) Regulations 2005. (Online). Available at: https://www.legislation.gov.uk/uksi/2005/2042/contents/made (Accessed August 2024).
[20] UK Government (2005). The Regulatory Reform (Fire Safety) order 2005. (Online). Available at: http://www.legislation.gov.uk/uksi/2005/1541/contents (Accessed August 2024).
[21] UK Government (2022). The Fire Safety (England) Regulations 2022. (Online). Available at: https://www.legislation.gov.uk/uksi/2022/547/contents/made (Accessed August 2024).

Legislation	Legislation Issue
	standard required to be achieved for all qualifying structures which are applicable to the Proposed Works.
The Energy Act 2013[22]	The Energy Act creates and empowers the ONR as the primary regulator of safety and security in the UK with respect to nuclear facilities.
Planning (Hazardous Substances) Regulations 2015[23]	The regulations require that all sites carrying significant quantities of hazardous substances i.e., those which could cause a major accident to apply for consent from their local Hazardous Substance Authority (HSA).
The Environmental Permitting (England and Wales) Regulations 2016[24]	The regulations provide a regulatory mechanism to control discharges and emissions to the environment to minimise/ prevent the risk of environmental harm.

Policy

18.2.2. A summary of the relevant policies is given in **Table 18-2**.

Table 18-2 - Policy relevant to major accidents and disasters

Policy Reference	Policy Relevance
National policy	
National Planning Policy Framework (NPPF) (2023)[25].	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development, and has informed the development of the Proposed Works. The NPPF outlines the following which are relevant to MA&Ds:

[22] UK Government (2013). Energy Act 2013 (SI 2013/c.32) (Online). Available at: http://www.legislation.gov.uk/ukpga/2013/32/contents (Accessed February 2024)
[23] UK Government (2015). Planning (Hazardous Substances) Regulations 2015. (Online). Available at: https://www.legislation.gov.uk/uksi/2015/627/contents/made (Accessed August 2024).
[24] UK Government (2016). The Environmental Permitting (England and Wales) Regulations 2016 (Online). Available at: https://www.legislation.gov.uk/uksi/2016/1154/contents/made (Accessed August 2024).
[25] Ministry of Levelling Up, Housing, and Communities (2023). National Planning Policy Framework (Online). Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf (Accessed August 2024).

Policy Reference	Policy Relevance
	"*101. Planning policies and decisions should promote public safety and take into account wider security and defence requirements by:* *a) anticipating and addressing possible malicious threats and natural hazards, especially in locations where large numbers of people are expected to congregate. Policies for relevant areas (such as town centre and regeneration frameworks), and the layout and design of developments, should be informed by the most up-to-date information available from the police and other agencies about the nature of potential threats and their implications. This includes appropriate and proportionate steps that can be taken to reduce vulnerability, increase resilience and ensure public safety and security";* "*194. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively*". Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above, the NPPF needs to be considered in the context of the application.
Local policy	
Adopted West Somerset Local Plan to 2032 (2016)[26]	Adopted in 2016, it is the local development plan covering the Works Area and includes: ▪ Policy NH10: Development in Proximity to Hinkley Point Nuclear Power Station [sic] "Development proposals in the consultation zones will be considered in consultation with the (ONR), having regard to the scale of development proposed, its location, population distribution of the area and the

[26] West Somerset Council (2016). West Somerset Local Plan to 2032 (Online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (Accessed August 2024).

Policy Reference	Policy Relevance
	impact on public safety, to include how the proposal would impact on local emergency planning arrangements and other planning criteria. Consultation on planning applications must be undertaken with ONR."
Somerset Waste Core Strategy[27] (2013)	This strategy covers the Somerset County Council's approach to planning for sustainable waste management until the year 2028. It covers all forms of waste including household, commercial, industrial and construction waste. As the handling of radioactive waste material is scoped out of assessment, there is limited relevance to MA&Ds.

Technical guidance

18.2.3. The technical guidance contained in **Table 18-3** is relevant to the assessment of major accident and disaster effects. Additional guidance may be applicable during the EIA, and this will be referred to as appropriate in the ES.

Table 18-3 - Technical Guidance relevant to major accidents and disasters

Technical Guidance	Context
Licence condition handbook[28]	The licence condition handbook provides the baseline standards for safety which will be in place at Nuclear Licensed Sites that are regulated by the ONR.
Tolerability of Risk from Nuclear Power Stations[29]	This guidance informs the criteria for tolerability (significance) of risk for major accidents affecting human receptors, especially those related to nuclear power stations.
Guidance on the Interpretation of Major Accidents to the Environment for the purposes of COMAH Regulations[30]	This guidance provides the thresholds of a major accident for environmental receptors.

[27] Somerset County Council (2013). Somerset Waste Core Strategy (Online). Available at: somersetcc.sharepoint.com/sites/SCCPublic/Waste/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FWaste%2FSomerset Waste Core Strategy%2Epdf&parent=%2Fsites%2FSCCPublic%2FWaste&p=true&ga=1 (Accessed August 2024).
[28] ONR (2017). Licence condition handbook (Online). Available at: https://www.onr.org.uk/media/gixbe2br/licence-condition-handbook.pdf (Accessed August 2024).
[29] HSE (1992) The tolerability of risk from nuclear power stations (Online) Available at: https://www.onr.org.uk/media/v1vi3v21/tolerability.pdf (Accessed August 2024).
[30] Department for the Environment, Transport and Regions (1999). Guidance on the Interpretation of Major Accident to the Environment for the Purpose of the COMAH Regulations (Online). Available at: https://www.sepa.org.uk/media/219153/detr-guidance-1999.pdf (Accessed August 2024).

Technical Guidance	Context
Reducing Risks Protecting People (R2P2)[31]	This guidance informs the criteria for tolerability (significance) of risk for major accidents affecting human receptors.
Guidelines for Environmental Risk Assessment and Management Green Leaves III[32]	This guidance provides supporting information for environmental risk assessment.
Guidance Emergency Preparedness: Guidance on part 1 of the Civil Contingencies Act 2004 (CCA), its associated regulations and non-statutory arrangements[33]	This guidance sets out requirements for risk assessment of emergencies (which include major accidents and disasters) by local resilience forums. It provides additional criteria which inform the harm criteria for human receptors.
A guide to the Control of Major Accident Hazards Regulations (COMAH)[34]	This guidance provides interpretation of how the COMAH regulations should be applied for a COMAH establishment and how this is ensured by the regulatory process for major hazard sites.
All Measures Necessary – Environmental Aspects Guidance to the Competent Authority Inspectors and Officers, 2016. COMAH Competent Authority[35]	This guidance provides the baseline standards for safety which will be in place at the COMAH establishment ensured by the regulatory process for major hazard sites.
Chemicals and Downstream Oil Industry Forum (CDOIF) – Environmental Risk Tolerability for COMAH establishments V2, 2016[36]	This guidance provides detail on the harm criteria and risk tolerability for environmental receptors.
Environmental Impact Assessment of Projects, Guidance on the Preparation of the Environmental Impact Assessment Report[37]	This guidance allows for the use of risk-based criteria in EIA assessments and provides detail about the purpose of including major accidents and disasters in EIA.

[31] HSE (2001). Reducing Risk Protecting People (R2P2) (Online) Available at: https://www.hse.gov.uk/enforce/assets/docs/r2p2.pdf (Accessed August 2024).
[32] UK Government (2011). Guidelines for Environmental Risk Assessment and Management Green Leaves III (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69450/pb13670-green-leaves-iii-1111071.pdf (Accessed August 2024).
[33] Cabinet Office (2012). Guidance Emergency Preparedness: Guidance on part 1 of the Civil Contingencies Act 2004. (CCA) (Online) Available at: https://www.gov.uk/government/publications/emergency-preparedness (Accessed August 2024).
[34] HSE (2015). The Control of Major Accident Hazards Regulations 2015 Guidance on Regulations, Ed 3 (Online). Available at: https://www.hse.gov.uk/pubns/priced/l111.pdf (Accessed August 2024).
[35] COMAH Competent Authority (2016). All measures necessary. (Online). Available at: https://www.sepa.org.uk/media/219152/d130416_all-measures-necessary-guidance.pdf (Accessed August 2024).
[36] Chemical and Downstream Oil Industries Forum (n.d.). Environmental Risk Tolerability for COMAH Establishments (Online). Available at: https://www.sepa.org.uk/media/219154/cdoif_guideline__environmental_risk_assessment_v2.pdf (Accessed August 2024)
[37] European Commission (2017). Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report. (Online). Available at: http://publications.europa.eu/resource/cellar/2b399830-cb4b-11e7-a5d5-01aa75ed71a1.0001.03/DOC_1 (Accessed August 2024).

Technical Guidance	Context
Guide to Predicting Environmental Recovery Durations for Major Accidents[38]	This guidance supports the assessment of major accidents affecting environmental receptors.
Planning Inspectorate Advice Note 11 Annex G – The Health and Safety Executive[39]	While this guidance applies strictly to the Infrastructure Planning regime, rather than EIADR, this guidance informs how the HSE will engage with EIAs.
External Hazards, Nuclear Safety Technical Assessment Guide NS-TAST-GD-013 Revision 7[40]	These guidance documents provide the baseline standards for safety which will be in place at Nuclear Licensed Sites ensured by the ONR regulatory process.
Internal Hazards, Nuclear Safety Technical Assessment Guide NS-TAST-GD-014 Revision 7[41]	
Land Use Planning and the Siting of Nuclear Installations, ONR Guide, NS-LUP-GD-001 Revision 0[42]	
Guidance on the Demonstration of ALARP (As Low As Reasonably Practicable), Nuclear Safety Technical Assessment Guide NS-TAST-GD-005 Revision 11[43]	
Safety Assessment Principles for Nuclear Facilities[44]	
Major Accidents and Disasters in EIA: A Primer[45]	This document provides specific guidance with respect to the consideration of major accidents and disasters in the context of EIA.

[38] Energy Institute (2017). Guide to Predicting Environmental Recovery Durations for Major Accidents. Available at: Guide to predicting environmental recovery durations from major accidents. Supporting guide to the Environmental risk tolerability for COMAH establishments guideline | EI - Publishing (energyinst.org) (Accessed August 2024).
[39] HSE (2017). Annex G – The Health and Safety Executive, The Planning Inspectorate Advice Note (Online) Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2018/03/Advice-note-11-Annex-G.pdf (Accessed August 2024).
[40] ONR (2018) Office for Nuclear regulation External Hazards (Online). Available at: https://www.onr.org.uk/publications/regulatory-guidance/regulatory-assessment-and-permissioning/technical-assessment-guides-tags/nuclear-safety-tags/ns-tast-gd-013-external-hazards/ (Accessed August 2024).
[41] ONR (2021) Office for Nuclear regulation Internal Hazards (Online). Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.onr.org.uk%2Fmedia%2Flrnfqbg1%2Fns-tast-gd-014.docx&wdOrigin=BROWSELINK (Accessed August 2024).
[42] ONR (2018). Land use planning and the siting of nuclear installations (Online) Available at: https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.onr.org.uk%2Fmedia%2Fvdnhkz4j%2Fns-lup-gd-001.docx&wdOrigin=BROWSELINK (Accessed August 2024).
[43] ONR (2020). Guidance on the demonstration of ALARP (As Low As Reasonably Practicable) (Online). Available at: https://www.scribd.com/document/532689303/ns-tast-gd-005 (Accessed August 2024).
[44] ONR (2020). Safety Assessment Principles for Nuclear Facilities, 2014 Edition, Revision 1 (January 2020) (Online) Available at: https://onr.org.uk/media/pobf24xm/saps2014.pdf(Accessed August 2024).
[45] IEMA (2020). Major Accidents and Disasters in EIA: A Primer. (Online) Available at: https://www.iema.net/document-download/48915 (Accessed August 2024).

18.3 Data gathering methodology

Study Area

18.3.1. The Study Areas below are to identify receptors which could be affected by internal[46] major accidents arising from the Proposed Works. The spatial extent of the areas are based on professional judgment taking into account the extent of the potential major accidents and disasters and the sensitivity of the relevant receptors. These are largely aligned to the Study Areas identified in the Scoping Report submitted to ONR, but the Study Area for human populations and the historic environment have been reduced to 1 km based upon a better understanding of the potential MA&D effects that has been achieved following the submission of the Scoping Report. The following study areas are buffers which have been applied to the Works Area:

- marine receptors – 10 km;
- surface water receptors – 10 km;
- land based ecological receptors – 10 km;
- human population receptors – 1 km;
- historic environment receptors – 1 km; and
- groundwater receptors – 1 km.

18.3.2. The following Study Areas have been applied to sources of external[46] major accidents and disasters, these are consistent with those applied in the Scoping Report. The following study areas are buffers which have been applied to the Works Area:

- airports – 20 km;
- external sites holding hazardous materials [sites with hazards substances consent (including COMAH sites), licensed explosives sites, and MACR sites]: 10 km in line with the OEPZ and the COMAH Safety Report Assessment Manual (SRAM)[54]; – 10 km;
- hazardous pipelines – 1 km; and
- natural disasters – not applicable – the vulnerability to natural disasters will be reviewed within the assessment (Appendix 18B) based upon the potential effects as geographic location is less applicable to some forms of disaster e.g., high winds.

18.3.3. The extents of the Study Areas are based on the extent of the potential major accidents and disasters and the sensitivity of the receptors. The temporal scope of Study is based on the programme of the Proposed Works as described in **Chapter 2: The Decommissioning Process**.

Desk study

18.3.4. The assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of data sources. The principal data sources used to inform this chapter for potential effects comprise the following:

- European Commission (EC) - Major Accident Reporting System (eMARS);

[46] Internal factors are those relevant elements of the baseline which arise from the Project or infrastructure owned by the Applicant, whereas external factors are those relevant elements which arise from outside the control of the Applicant whether this be third-parties or natural sources.

- ONR quarterly statements of nuclear incidents at nuclear installations[47];
- Avon and Somerset Community Risk Register[48];
- information provided by the Applicant regarding to the baseline decommissioning plan for HPB; and
- National Risk Register[49].

Survey work

18.3.5. No survey work has been undertaken for the assessment of MA&D.

Data limitations

18.3.6. There are currently no known limitations on the baseline data that impact the validity of this assessment.

18.4 Consultation

Pre-application Opinion

18.4.1. Based on review of the Scoping Report, a Pre-Application Opinion was issued by the ONR (provided in **Appendix 5A**). The ONR made no comments relating to Major Accidents and Disasters specifically.

Non-statutory consultation

18.4.2. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

18.4.3. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

Responses to both the first and second rounds of non-statutory consultation are presented in the **Consultation Feedback Report**. No comments relevant to the major accidents and disasters assessment were made.

Technical engagement

18.4.4. No technical engagement has been undertaken in relation to the major accidents and disasters assessment.

[47] ONR (2022). Quarterly statements of nuclear incidents at nuclear installations. (Online). Available at: http://www.onr.org.uk/quarterly-stat/index.htm (Accessed August 2024)
[48] Avon and Somerset Local Resilience Forum (n.d.) Avon and Somerset Community Risk Register [Online]. Available at: https://media.aspolice.net/uploads/production/20221121112702/Community-Risk-Register.pdf (Accessed August 2024)
[49] Cabinet Office (2023). National Risk Register 2023 edition. (Online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1175834/2023_NATIONAL_RISK_REGISTER_NRR.pdf (Accessed on August 2024).

18.5 Overall baseline

Current baseline

18.5.1. A full description of the Proposed Works and Works Area are provided in **Chapter 2: The Decommissioning Process.**

18.5.2. HPB is located on the Somerset Coast on the shores of the Bristol Channel, 25 km to the east of Minehead and 12 km to the north-west of Bridgwater. It lies within the jurisdiction of Somerset Council. The HPB Site is bounded to the north by Bridgwater Bay (part of the Severn Estuary) and to the west by Hinkley Point A (HPA). The village of Shurton lies to the south. The development site of Hinkley Point C (HPC) lies to the west of HPA which is undergoing construction.

18.5.3. HPB itself is located within a coastal area, centred on National Grid Reference (NGR) 321400, 146080.

18.5.4. A description of the facilities at HPB is provided in **Chapter 2: The Decommissioning Process**.

18.5.5. HPB is a 1,320 MW twin reactor Advanced Gas-Cooled Reactor (AGR) site, and during operation, supplied up to 965 MW to the grid via two steam turbine generator systems. The power station facilities include the reactors, the turbines, an electricity sub-station connecting to the grid, along with associated plant, equipment and infrastructure equipment to safely support the operations of the systems. Although it should be noted that not all of this infrastructure is part of the Proposed Works, such as the substation, which is on a long-term lease agreement to National Grid and therefore is situated outside of the Works Area. The power station commenced generation in 1976 and ceased in August 2022, defueling of the power station has already commenced.

Internal Factors

18.5.6. The facility is a licensed nuclear site. It was also formerly a Lower Tier[50] establishment under COMAH, holding quantities of fuel oil/ kerosene, ammonia, hydrazine, hydrogen, oxygen, propane, methane, phosphate ester fire resistant fluid, and zinc bromide. As part of the defueling process, the inventory of these substances has been significantly reduced such that HPB notified the ONR and the Environment Agency as such under the COMAH Regulations in April 2024. While some residual inventories remain on site, and will continue to do so, it is not anticipated that the Site will be a COMAH establishment at any point during the Proposed Works.

18.5.7. Hazardous Substances Consent (HSC) is in place at HPB, which permits the storage of various hazardous substances including the fuels and water treatment chemicals.

18.5.8. A description of the process drains and surface drainage system is provided in **Chapter 11: Surface Water and Flood Risk.**

18.5.9. There are emergency response arrangements in place for HPB, as required by the Nuclear Site Licence and under REPPIR19[51]. The emergency arrangements provide a state of preparedness to respond to radiological and non-radiological events. Station personnel are trained for roles in emergency response. The plans are integrated with those of the local authority, and the emergency

[50] There are two types (tiers) of establishment which are subject to COMAH, known as 'Upper Tier' and 'Lower Tier' depending on the quantity of dangerous substances they hold. Upper Tier establishments will hold greater quantities of dangerous substances meaning that additional requirements are placed on them by the Regulations.
[51] UK Government (2019). The Radiation (Emergency Preparedness and Public Information) Regulations 2019 (SI 2019/703). (online). Available at: https://www.legislation.gov.uk/uksi/2019/703/contents/made (Accessed August 2024).

services (including police, fire, ambulance and NHS, and Marine and Coastguard Agency as applicable). The emergency plan and the arrangements made to implement the plan are regularly rehearsed and reviewed to maintain an adequate state of readiness. Exercises provide a thorough test of emergency arrangements and are required as part of the Nuclear Site Licence and under REPPIR.

External Factors – manmade

18.5.10. The adjacent HPA is currently in a Preparation for Care and Maintenance phase of decommissioning (until 2031) and will subsequently enter into Care and Maintenance (equivalent to Quiescence Phase of the Proposed Works for HPB). At a later date, the HPA site will undergo final site clearance while the HPB Site is in Quiescence. HPA has already been defueled and the majority of the hazardous chemicals have already been removed as part of the decommissioning process.

18.5.11. HPC is being constructed to the west of the Site, although it is buffered by HPA. HPC is currently undergoing intensive construction but during the HPB Preparations for Quiescence phase, HPC will be in commissioning and then the early stages of power generation. HPC Reactor 1 is intended to be in operation around the end of the decade, with full commissioning of Reactor 2 shortly after. HPC has an operational design life of 60 years, which will occur during the Preparations for Quiescence and Quiescence phases of HPB. HPC is expected to be in a state of decommissioning during the Final Site Clearance phase at HPB. HPC is regulated under a Nuclear Site Licence and associated Safety Case governed by the ONR, which will be reviewed and developed through the lifecycle of HPC. HPC will also become a COMAH Site prior to the start of its generation phase, although no application for Hazardous Substances Consent has yet been made.

18.5.12. There are no airports located within 20 km of the Works Area, with the closest being Cardiff Airport and Bristol Airport, which are located 25.1 km north-west and 34.5 km north-east respectively of the HPB Site.

18.5.13. No COMAH or Major Accident Control Regulations (MACR) sites other than HPB have been identified within 10 km of the Site. Any application for Hazardous Substances Consent in the vicinity of the Proposed Works will need to involve consultation with the HPB site representatives. There are no Major Accident Hazard Pipelines (MAHP) identified within 1 km of the Site.

External Factors – environmental conditions

18.5.14. HPB has been designed to allow for extreme weather events as part of the design basis and has specific operating instructions in place for extreme weather conditions e.g., extreme winds, extreme flooding, rainfall and seismic events.

18.5.15. The projected impact of climate change on the environmental conditions is uncertain, but estimates of the potential impact have been undertaken on the basis of the available climate projections. The assessment undertaken for the Post Defueling Safety Case determined that climate change impacts do not present a major hazard to the Site. Information regarding the impact on environmental conditions is provided in **Appendix 7B: Climate Change Resilience of the Proposed Works**

18.5.16. Fluvial, coastal and surface water flooding is considered in **Chapter 11: Surface Water and Flood Risk:**

- **fluvial and coastal**: The Environment Agency Flood Map for Planning (which does not distinguish between fluvial and coastal flood sources) indicates that the majority of the Works Area lies within Flood Zone 1, i.e. has a very low probability of coastal and / or fluvial flooding

(< 0.1% AEP), in particular due to flood defences providing protection along the adjacent coastline. The exception to this is the south eastern part of the Works Area where the Sewage Works is located, which has a high probability of fluvial and / or coastal flooding (> 1% AEP and / or 0.5% AEP respectively; and

- **surface water**: The Environment Agency flood risk map shows several areas within the Works Area are at High (greater than a 3.33% AEP), Medium (between a 3.33% AEP and 1% AEP) and Low Risk (between 1% AEP and 0.1% AEP) of surface water flooding. The High Risk areas are small in extent and are found on roads within HPB at depths predominantly up to between 0 and 0.15 m. The medium risk areas are centred around the access routes within the Works Area, comprising two small depressions in the central eastern side of the Works Area and some small confined areas in the southern extent of the Works Area at depths of predominantly between 0.15 m and 0.3 m.
- It is noted that some of the Works Area lies below the Mean High Water Springs (MHWS), so this is excluded from the description above as it is located within the normal tidal range of the Bristol Channel.

18.5.17. Geology and hydrogeology are discussed in **Chapter 12: Soils, Geology and Hydrogeology**. The surface water drainage is described in **Chapter 11: Surface Water and Flood Risk**. The information is relevant to MA&D in respect of the pathways by which releases to ground and surface water could reach receptors. Key points are:

- Groundwater flow beneath the Works Area is to the north towards the sea, with water levels typically 2-3 m below the natural ground surface. Groundwater levels may be influenced by tidal variation in the Bristol Channel. The natural flow regime is also likely to have been influenced by the station construction.
- Surface water drainage within the HPB Site is directed to the coastal site boundary to the north, with HPB being lower than HPA. Elsewhere there are drainage rhynes to the south and east of the HPB that outfall to the coast on the eastern site boundary near Hankley Brake. A further drainage rhine runs along part of the western site boundary. There are two small ponds on the HPB Site, one at the southern end of the nature trail and the other at the eastern corner, near the sewage treatment works.

18.5.18. Historic environment receptors are discussed in detail in **Chapter 13: Historic Environment**. The only designated historic environment receptor within the Study Area is the Scheduled Monument named Pixie's Mound (NHLE 1006226) which is located 280 m south-west of the Works Area. No listed buildings, world heritage sites or conservation areas are located within the Study Area for MA&Ds assessment.

18.5.19. Terrestrial based ecology is discussed in **Chapter 8: Terrestrial Biodiversity and Ornithology** with full details regarding the ecological receptors and key designated sites surrounding the Works Area. The main receptor is the adjacent Severn Estuary, which is classified as a Special Protection Area (SPA), Special Area of Conservation (SAC) and Ramsar Site, although this designation covers an extensive area of the estuary, the majority of which is outside the Study Area. There is also the Bridgwater Bay SSSI which lies immediately to the north of the licensed site, other designated receptors are more distant and are described in **Table 18-8**.

Future baseline

18.5.20. As part of the Proposed Works, new arrangements for waste management may be required with corresponding needs for compliance under separate consenting regimes. The nature and extent of the major accidents from the Proposed Works and any new arrangements for waste management will be considered as components of the future baseline.

18.5.21. The key factors that may alter the future baseline conditions and that could therefore influence the nature, exposure, likelihood and consequences of major accidents and disasters and that will be considered further in the assessment of potentially significant effects in the ES factors are:

- **Climate change** – in general for the UK, it is predicted to lead to an increase in peak rainfall intensities and resulting flood flows over time, with wetter winters and drier summers (based on the UK Climate Change Projections 2018 (UKCP18), which are presented **Chapter 7: Climate Change** and associated **Appendix 7B: Climate Change Baseline)**. However, site specific projections for HPB do not predict on increase in peak rainfall intensity. Climate change is also expected to change the temperatures experienced over the duration of the Proposed Works with an increase in peak temperatures. Climate change is expected to alter the prevalence of extreme weather conditions which could lead to a disaster. This is described in further detail in **Chapter 7: Climate Change.**
- **Coastal Flooding** – climate change analysis indicates a change in the risk of coastal flooding during the period of the Proposed Works. Coastal flood risk is assessed in detail in **Chapter 11: Surface water and flood risk** and **Appendix 11A Flood Risk Assessment**, so that analysis is not repeated here to prevent duplication.
- **Changing land use** may mean that the surrounding environment could become more agricultural, industrial, residential or recreational in use. Changing ecological baselines resulting from the land use and climate change factors may also impact the local ecology and associated environmental designations of the land. As the surrounding environment changes, so do the receptors which could be affected. If land adjacent to the Works Area were to become designated or receive a higher level of designation, then the sensitivity of receptors could increase.
- **Technological improvement** - it is anticipated that there may technological development over the lifetime of the Proposed Works. This could lead to other ways of approaching the final decommissioning, however, as a bounding case for assessment, the Proposed Works as described in **Chapter 2: The Decommissioning Process** are based upon established techniques and technologies. These improvements could include advances in remote handling, robots or decontamination techniques. These are likely to reduce the risk posed to the environment (human and non-human receptors); however, they may also introduce new hazards that would need to be managed at the appropriate time.

18.5.22. The construction of HPC will be completed, followed by commissioning and operation. The nature and extent of the major accidents from the HPC facilities which could affect the workforce of the Proposed Works, and vice versa, will change as the design progresses. The interfaces and potential impacts will need to be managed throughout the Proposed Works.

18.6 Embedded environmental measures

18.6.1. One of the conditions of the nuclear site licence (NSL) is that the Licence Holder has adequate arrangements in place for the production and assessment of nuclear safety cases. The Applicant is required to prepare a nuclear safety case, which the presents the evidence the facility or activity can be operated safely. It is required to be maintained live throughout the full lifecycle of the plant or facility, from concept design, through construction, commissioning, operation and, ultimately, decommissioning.

18.6.2. The Applicant has implemented a well-established integrated management system (IMS) across Nuclear Operations for decades; the IMS is a cornerstone of enacting normal business activities, as well as the generation and decommissioning strategies. The two general aims of the IMS are:

- To improve the safety performance including environmental safety of the organisation through the planning, control, and supervision of safety related activities in normal, transient, and emergency situations.
- To foster and support a strong safety culture through the development and reinforcement of good safety attitudes, values and behaviour in individuals and teams to allow them to carry out their tasks safely.

18.6.3. The IMS comprises of an extensive range of process; environmental management is one of the key IMS processes. A range of environmental measures have been embedded into the Proposed Works as summarised in **Table 18-4**; these include measures which are already inherent within the nuclear safety case and the IMS and those specific to the Proposed Works.

Table 18-4 - Summary of Embedded Environmental Measures and Good Practice Measures

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
The Site was previously a Lower Tier COMAH establishment, but has moved out of the scope of COMAH since April 2024. The Major Accident Prevention Policy (MAPP) or similar and Incident Management Plan will be maintained to an appropriate standard by the Site Licensee for the full duration of the Proposed Works.	IMS	Embedded Measure
The Works Area will remain a licensed nuclear site throughout the Proposed Works until the completion of the Final Site Clearance phase, and the licensing requirements include maintaining a suitable Safety Case in accordance with the Nuclear Installations Act[17] and approved Security Plan in accordance with Nuclear Industries Security Regulations[13].	Nuclear Site Licence	Embedded Measure
The design standard of built structures will enable the structures to withstand external loads, such as, but not limited to wind or precipitation and will be maintained up to the point of decommissioning that structure, considering any foreseeable changes to design loads.	Functional Specification	Good Practice
Appointment and management of contractors will be managed in accordance with the IMS, to ensure compliance with all regulatory requirements.	Integrated Management System	Embedded Measure
The Site Licensee will adapt the current arrangement systems and processes in place for the avoidance, prevention, control and mitigation of major accidents and disasters from the operational site conditions in respect of the Proposed Works and revise these as necessary for the duration of the Proposed Works.	Integrated Management System	Embedded Measure

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
The Site Licensee will ensure that all activities are subject to a suitable and sufficient risk assessment and with full consideration of the hierarchy of controls, ensure that the residual risk arising from all major accidents and disasters is reduced to As Low As Reasonably Practicable (ALARP).	Integrated Management System	Good Practice
The decommissioning of the surface water drainage, bunding and containment, and any other relevant safeguards will be assessed against the ongoing risk of major accidents, and the residual risk will be maintained at a level that is ALARP, throughout the duration of the proposed works.	Integrated Management System	Embedded Measure
Emergency response procedures will be adapted from current emergency arrangements and consider the potential for releases of hazardous materials and will define the actions to be taken to minimize the risk arising from potential releases.	Integrated Management System	Embedded Measure
Work management and risk assessment (including Hazardous Works) will be managed in accordance with the IMS, which ensures hazardous works are undertaken by appropriately Suitably Qualified Experienced Personnel (SQEP) and trained operators.	Integrated Management System	Embedded Measure
Structural surveys will be undertaken before commencement of dismantling operations. Furthermore, the dismantling has been designed to minimise the risks associated with structural failure (e.g., of support systems).	Compliance with CDM regulations	Good Practice
The Site Licensee will provide access to reliable meteorological forecasting services to inform work planning and controls to prevent undertaking works in inappropriate conditions such as heavy crane lifts in high winds.	EMP	Good Practice

Embedded Measure	Compliance Mechanism	Embedded measure or good practice
Emergency response procedures will consider the potential for significant weather events or other natural hazards and will define the actions to be taken to minimize the risk arising from these events.	EMP	Good Practice
The Site Licensee will review planning applications in the vicinity of the Proposed Works and provide representation / objection to any proposed development which would lead to a significant increase in risk at the Works Area as appropriate.	EMP	Good Practice
The Site Licensee will liaise with other relevant stakeholders through the existing Site Stakeholder Group to identify any potential hazards which arise over the course of the Proposed Works.	EMP	Good Practice

18.7 Assessment methodology

18.7.1. This section describes the assessment approach and methodology which has been applied in ES. The assessment of effects related to the works has considered the different phases of the Proposed Works.

18.7.2. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 2: The Decommissioning Process**. However, whilst this has informed the approach that has been used in this MA&D chapter, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the major accidents and disasters assessment in this ES.

18.7.3. In summary, the method for assessment of MA&D for this ES involves qualitative assessment of the risks related to the 'scoped in' potential major accidents and disasters (**Table 18-**) and comparison of such risks against recognised risk tolerability criteria (**Table 18-6**) to identify significant effects. If required, additional environmental measures have been considered to ensure that relevant effects are not significant.

Definitions and context

18.7.4. For the purposes of this chapter, major accident and disaster is defined as:

- major accident - a reasonably foreseeable but unintended event caused by a man-made activity or asset that leads to serious damage on receptors, either immediate or delayed. The activity causing the event may be either within the project, or external to it; and

- disaster – a natural occurrence that is reasonably foreseeable and leads to serious damage on receptors, either immediate or delayed.

18.7.5. Where serious damage is used, for the purpose of this assessment, it is defined as:

- serious damage to human populations – this includes harm which would be considered substantial i.e., death(s), multiple serious injuries or a substantial number requiring medical attention; and
- serious damage on the environment – loss or significant detriment to populations of species or organisms, valued sites (including designated sites), valued cultural heritage sites, contamination of drinking water supplies, ground or groundwater, or harm to environmental receptors.

18.7.6. An immediate effect is one that is self-evident at the time of the event (e.g., fire damage, or injury to persons).

18.7.7. A delayed effect is one which becomes evident only after time (e.g. loss of feeding ground leading to a change in the ecosystem).

18.7.8. The threshold at which the consequences of an event can be considered a major accident or disaster varies by receptor to reflect the sensitivity of the receptor and its intrinsic value.

18.7.9. The applied threshold criteria for consequence are aligned to the UK criteria, and they are outlined in **Appendix 18A** of this ES. For each type of receptor, the threshold of a major accident or disaster has been defined with due regard to relevant major hazard legislation and supporting guidance[36] [29] [31]. The judgement as to whether a major accident or disaster meets or exceeds the threshold is qualitatively based on the inherent consequences, without accounting for embedded environmental measures.

18.7.10. This chapter considers potential major accidents and disasters that originate from:

- internal events e.g., loss of containment of chemical storage for the Proposed Works or unplanned collapse of a building during demolition; and
- external events (including natural disasters), where the Proposed Works have a material effect on the extent or severity of the major accident or disaster e.g., an incident off-site causes failure of chemical storage used for decommissioning activities that impacts on receptors within the Proposed Works.

18.7.11. Major accidents and disasters are by their nature of high consequence (if they occur) and are not intended or planned to occur as part of the operation or design of a project (in this case the Proposed Works). They are typically, by their nature, very infrequent, but are important considerations so that resilience against them can be built into the delivery of a project at the planning stage. Resilience is established by ensuring that high consequence events are eliminated through location, layout or design options, or, where elimination is not possible, reduced to such an extent that the chance of them occurring is so small that they can be deemed not to be significant.

18.7.12. The ‘effects’, in EIA terms, arising from major accidents and disasters equate to the ‘risk’ (i.e. the potential for serious damage to a receptor before embedded environmental measures are considered, coupled with the likelihood of the damage being realised when planned environmental measures are taken into account) of the major accident/ disaster being realised, rather than simply

its consequence so that scenarios of infrequent likelihood, but with potentially high consequence can be appropriately included.

18.7.13. In this respect, the major accidents and disasters aspect differs from other EIA aspects: most other aspects predict and assess the effects from planned actions, whereas major accidents and disasters considers the effect of unintended events that are not expected to occur.

General approach

18.7.14. The requirement for consideration of MA&D in the ES is relatively new and definitive guidance on the assessment of major accidents and disasters within the context of the ES has yet to be published in the UK[52]. Two clear principles have however emerged from existing technical and ES guidance and have been adopted in the methodology adopted here:

- the notion of proportionality; and
- the established principle that only those effects which are identified as being likely to be significant need to be assessed within the ES.

18.7.15. Guidance provided by the European Commission (EC)[53] highlights that the purpose of including MA&D in an ES, is to ensure resilience to high consequence events which pose significant risk is built into proposed development activities (the Proposed Works in this case). The approach that has been adopted is aligned to the EC guidance. The scope covers those events which could impede the Proposed Works and may have adverse effects on potential receptors. The focus of the assessment is therefore to recognise any potential MA&D scenarios which may lead to significant environmental effects and mitigate against them, thereby building resilience into the Proposed Works and reducing vulnerability. The threshold for what may be considered significant (i.e., intolerable) includes much less frequent effects than are addressed in many other aspect chapters. Lesser magnitude events are generally tolerated much more readily than those of higher magnitude.

18.7.16. The assessment of significant effects for major accidents and disasters focuses on risk (i.e., the combination of the serious damage arising from a potential event and its likelihood of occurrence), rather than the magnitude of harm/ damage only. Therefore, not every possible event needs to be assessed, only those with the significant effects.

18.7.17. Risk tolerability for MA&D in the UK is built on the principle of eliminating intolerable risks and ensuring, particularly at iterative design stages, that any residual risks, while small are further minimised where practicable. This principle has been applied in the assessment here, with ‘intolerable risk’ referred to as the ES term ‘significant effect’ for the purposes of consistency with other environmental aspect assessments considered in this ES.

18.7.18. The methodology adopted for the assessment is qualitative as the design is at the planning stage. After consent is granted and as the design advances through further engineering design stages, the process of risk management will continue to ensure risk in the design will be maintained ALARP as part of the routine design and regulatory process.

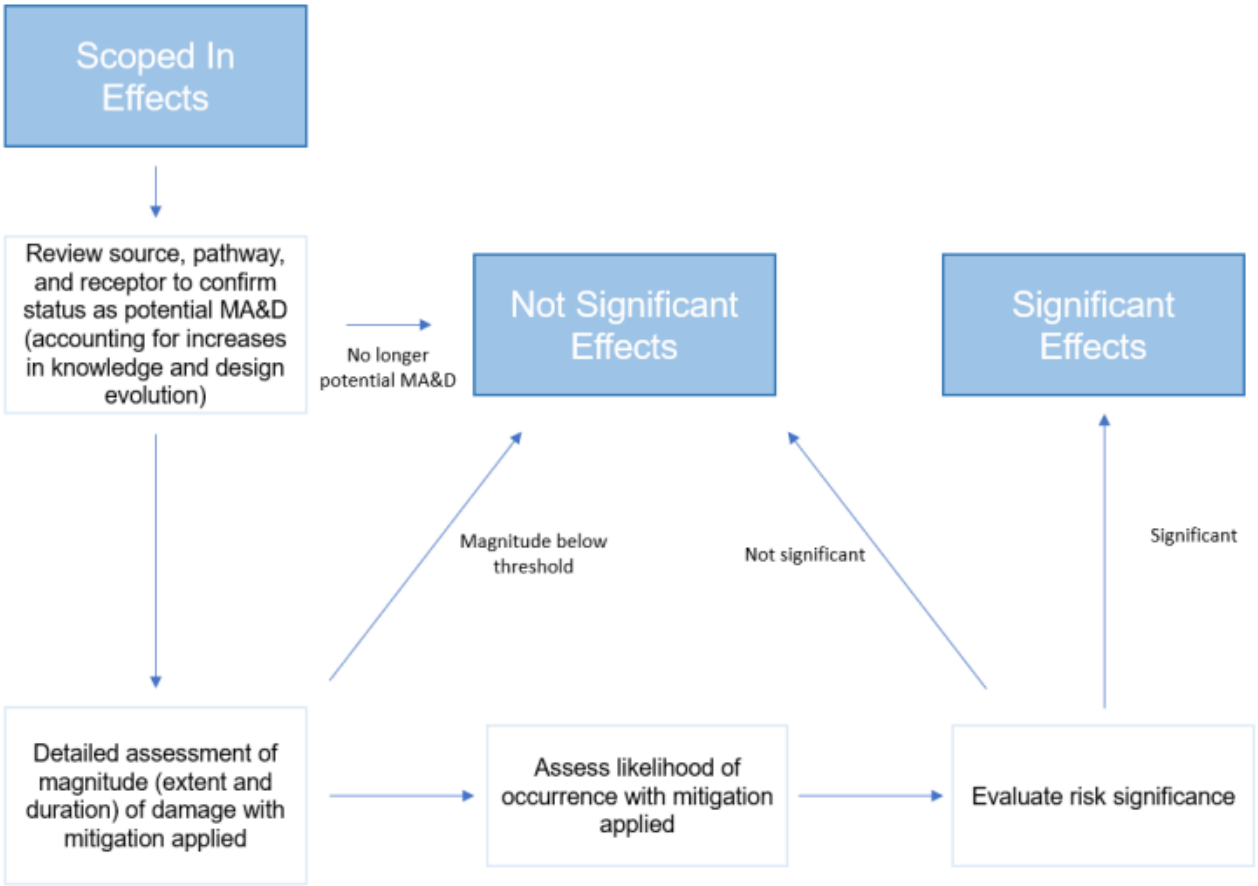
[52] A short summary document comprising a variety of approaches has been published by IEMA, see footnote 45.
[53] European Commission (2017), Environmental Impact Assessment of Projects – Guidance on Scoping

18.7.19. The following approach has been applied to the scoped-in MA&D scenarios and has been included in **Appendix 18B**:

- identify relevant potential receptors;
- identify relevant potential MA&Ds arising from or affecting the Works Area; and
- assess whether any credible pathways exist (i.e., the link between a source of an event and a receptor).
- qualitatively assess the harm/ damage which could be caused to the receptor to:
- eliminate those effects which do not meet the minimum threshold of serious damage/ harm from a major accident/ disaster; and, if the threshold is met;
- estimate the magnitude of accidents and disasters (if they were realised) at the receptor.
- qualitatively assess the likelihood of the effect, considering the range of impacts which may be associated with the source of an accident or disaster and taking into account the measures embedded in the Proposed Works which would reduce their occurrence and/or severity; and
- establish whether significant (i.e., intolerable) effects from major accidents and disasters exist.

This approach is summarised in **Graphic 18-1.**

Graphic 18-1 - Process for Assessment in ES



Determination of significance

18.7.20. The CDOIF36 and R2P2 risk tolerability criteria have been used in this assessment for establishing significance (risk tolerability) and to provide a consistent basis for the study against common benchmarks for MA&D applied across the UK in regulatory guidance and industry standards.

18.7.21. **Table 18-5** details the factors in defining the risk criteria.

Table 18-5 - Defining risk criteria for human and non-human receptors

Receptor type	Magnitude	Likelihood
Human Receptor	Severity of harm/damage The number of people affected	Likelihood of the event occurring
Non-human Receptor	Severity of harm/damage Duration of harm (i.e., its persistence – the recovery period over which the environment would recover or be restored)	Likelihood of the event occurring

18.7.22. For non-human environmental receptors, the severity of harm/ damage, and how readily recovery is possible, varies by the receptor grouping. For this reason, criteria are established for a range of receptor types, with the most onerous criteria applied to those receptors which are most sensitive.

18.7.23. The magnitude and likelihood of a scenario combine to provide a measure of risk (i.e., the combination of the harm/ damage arising from a potential event and its likelihood of occurrence). The fact that the Proposed Works are currently in the planning stage means that the estimates are necessarily qualitative and based on expert judgement informed by comparison against experience in similar industries and for similar developments, where practical.

Magnitude

18.7.24. The criteria used to establish magnitude, and its basis, are presented in **Appendix 18A.**

18.7.25. Potential major accidents or disasters are assessed against the magnitude criteria given in **Table 18A-1** (non-human receptor groups) and **Table 18A-4** (human receptor groups) of **Appendix 18A**, so that a magnitude level can be assigned (**Low**, **Medium**, **High**, and **Very High**), unless they are eliminated under any of the following cases:

- the magnitude, when assessed without taking into account embedded environmental measures, does not meet the threshold for major accident or disaster;
- if the 'source' does not directly cause a major accident, but influences the sequence of events leading to a major accident/ disaster being realised, the influence of the source is integrated into the event scenario assessment, but is not assessed further as a standalone scenario. This includes:
  - conditions such as snow and rain that make driving more dangerous, but do not directly cause accidents – these are considered as causal factors; and
  - impairment of an embedded environmental measure such as damage to a secondary containment designed to contain hazardous spillages – this does not cause a release, but if a spillage occurs while it is damaged the consequences are more likely to be major accident – these are considered in the assessment of likelihood

18.7.26. Any scenario which is excluded for the above reasons is assigned a category of **Not MA&D** (i.e., not major accident and disaster).

Determination of risk significance

18.7.27. Risk in the terminology of this assessment is a combination of magnitude and likelihood. **Table 18-6** gives the magnitude and a qualitative likelihood scale that is used to determine the level of risk and whether it is 'significant' or 'not significant' in the context of EIA. In the MA&D assessment, a significant effect would represent a level of risk that would generally be considered intolerable aligned to other UK Health and Safety regulatory regimes.

18.7.28. The assessment applies expert judgement to evaluate the likelihood of each potential major accident and disaster occurring, once embedded environmental measures are applied. The likelihood and risk reported is that above the baseline (i.e., the incremental likelihood and risk). This is the risk that can be attributed to the Proposed Works directly or indirectly.

18.7.29. While qualitatively stated, the definition and classifications used for likelihood are designed to be compliant with HSE's R2P2 for societal risk, and CDOIF[32] for environmental tolerability, if considered on a per effect basis rather than in terms of aggregated risk. Expert judgement has been used to establish the appropriate qualitative parameters for likelihood categorisation, with levels used ranging from 'Remote chance of occurring' through to 'Reasonable chance of occurring.' These then provide an allocation of likelihood against magnitude to determine risk significance, which in turn is an approach that is consistent with major accident tolerability perceptions commonly applied elsewhere in the UK.

Table 18-6 - Significance Matrix - Major accidents and disasters

Magnitude	Likelihood (per receptor per effect)				
	Remote chance of occurring	Very small chance of occurring	Small chance of occurring	Chance of occurring	Reasonable chance of occurring
Very high	Not significant	Significant	Significant	Significant	Significant
High	Not significant	Not significant	Significant	Significant	Significant
Medium	Not significant	Not significant	Not significant	Significant	Significant
Low	Not significant	Not significant	Not significant	Not significant	Significant

18.8 Scope of the assessment

Study area

18.8.1. The Study Areas for receptors include both those within the Works Area and those beyond the boundary of the Works Area within ranges summarised in **Table 18-7**. The extents of the areas are based on the extent of the potential major accidents and disasters and the sensitivity of the receptors. The Study Areas have been applied throughout the temporal scope of the Proposed Works. The basis for these areas is described in **Section 18.3.**

Table 18-7 - Study Areas by receptor type- Major accidents and disasters

Receptor type	Receptors in this group	Distance from Works Area
Marine receptors	Marine environment including designated sites	10 km
Human Population	Human populations.	1 km
Land Based Receptors	Ecological receptors including designated sites, habitats and species. Non-designated land.	10 km
Surface Water Receptors	Surface water bodies, habitats and species where not considered under marine, including drinking water sources.	10 km
Historic Environment Receptors	Designated heritage assets including conservation areas, scheduled monuments and listed buildings (Grade 1).	1 km
Groundwater Receptors	Groundwater bodies.	1 km

18.8.2. The assessment has considered sources of major accidents and disasters within the Works Area with buffers for external sources of major accidents or disasters as follows:

- airports: 20 km in line with the guidance for Nuclear Safety Cases40;
- external sites holding hazardous materials [sites with hazards substances consent (including COMAH sites), licensed explosives sites, and MACR sites]: 10 km in line with the OEPZ and the COMAH Safety Report Assessment Manual (SRAM)[54]; and
- major accident hazard pipelines: 1 km, consistent with maximum hazard distance identified for hazardous pipelines in CRR82/1994[55].

18.8.3. The potential effects assessed have been considered across the three phases of the Proposed Works, nominally; Preparations for Quiescence, Quiescence, and Final Site Clearance phases, as described in **Chapter 2: The Decommissioning Process**.

18.8.4. During the Quiescence phase, the presence of workers present within the Site will be substantially reduced which reduces the impact of the major accidents and disasters as the number of receptors is decreased. Additionally, the presence of stored chemicals and combustible materials will be minimal as they will have been removed during the Preparations for Quiescence phase.

[54] HSE (2015), Safety Report Assessment Manual (Appendix 13.1) Criterion 13.4. (Online) Available at https://www.hse.gov.uk/comah/assets/docs/s13.pdf (Accessed August 2024).
[55] HSE (1994). Risks from Hazardous Pipelines in the United Kingdom. Contract Research Report 82. (online) Available at: https://www.hse.gov.uk/research/crr_pdf/1994/crr94082.pdf (Accessed February 2024).

Potential receptors

18.8.5. Information about non-human receptors that could be subject to effects arising from MA&Ds associated with the Proposed Works is provided in other environmental aspect chapters, such as **Chapters 8: Terrestrial Biodiversity and Ornithology** and **Chapter 9: Marine Biodiversity**, which provide an overview of the baseline marine and terrestrial ecology; and **Chapter 13: Historic Environment** which provides details of the baseline historic environment. The baseline groundwater and aquatic environment is described in **Chapter 12: Soils, Geology and Hydrogeology.**

18.8.6. These are summarised in **Table 18-8.**

Table 18-8 - Receptors subject to potential effects

Receptor	Reason for Consideration
Human Receptors	Human Populations: ▪ Onsite workforce – At the End of Generation, there were 588 personnel employed at HPB and this is anticipated to decrease through the Preparations for Quiescence phase. There will be a small population of workers at the start of the Quiescence phase but these are likely to be removed after the first five years subject to regulatory approvals (**Chapter 2: The Decommissioning Process**). Site presence will then be rare until the Final Site Clearance phase. ▪ HPA workforce – HPA will be in preparation for and then enter into the Care and Maintenance (the Nuclear Restoration Services (NRS) term for Quiescence) during the HPB Preparations for Quiescence phase, and HPA would undergo final site clearance during the HPB Quiescence phase meaning the workforce present is likely to be negligible during the Preparations for Quiescence and Final Site Clearance phases for HPB. A workforce of several hundred people could be present for HPA final site clearance during the Quiescence phase. ▪ HPC workforce – the HPC site lies partially within the Study Area, HPC will be in a commissioning phase and then operational life during the Proposed Works, it is anticipated that there will be hundreds of workers on site during these phases. The following seven settlements lie within the 3.5 km Detailed Emergency Planning Zone (DEPZ) for the current operational site: Knighton, Burton, Shurton, Wick, Stogursey, Cockwood and Stolford – it should be noted that none of these are within the 1 km Study Area.

Receptor	Reason for Consideration
Land and Water Receptors	▪ The Severn Estuary is designated as a Ramsar site, Special Protection Area (SPA) and Special Area of Conservation (SAC); ▪ Exmoor and Quantock Oakwoods SAC; ▪ Huntspill River National Nature Reserve (NNR); ▪ Bridgwater Bay is a Site of Special Scientific Interest (SSSI) that includes Bridgwater Bay National Nature Reserve (NNR); ▪ Blue Anchor to Lilstock Coast SSSI; ▪ Ge-Mare Farm Fields SSSI; ▪ Quantocks SSSI; ▪ Berrow Dunes SSSI; ▪ Quantock Hills Area of Outstanding Natural Beauty (AONB); and ▪ an owned area of land, west of HPB owned by the Applicant, has been non-statutorily designated as a County Wildlife Site (CWS) for its conservation value. There are a further eight CWSs within 3 km of the HPB Site; ▪ Widespread land and water receptors in relation to biodiversity, which are described in **Chapters 8: Terrestrial Biodiversity and Ornithology** and **9: Marine Biodiversity**; ▪ The baseline groundwater and aquatic environment is described in **Chapter 12: Soils, Geology and Hydrogeology.** Key points for major accidents and disasters are: ▪ there are no licensed extractions or boreholes within the Study Area; and ▪ fresh and estuarine water habitats are described in **Chapter 10: Coastal Management and Water Quality**. Other water receptors include Hawkridge reservoir, which is a designated as drinking water source.
Historic Environment	The only designated historic environment receptor within the Study Area is the Pixie's Mound Scheduled Monument located 280 m to the South West of the Works Area.

Scoped in effects

18.8.7. The potentially significant major accidents and disasters effects that have been assessed are summarised in Table 18-. Detailed source-pathway-receptor linkages have been developed, where they are credible, and are given in **Appendix 18B Impact Assessment of scoped-in scenarios**.

18.8.8. The term 'Likely significant major accident and disaster effect' is defined to mean a major accident or disaster for which the risk of harm has not yet been demonstrated to be not significant. In this context, the term 'likely' is not a reference to the likelihood of occurrence but the potential for an event to occur.

Table 18-9 - Likely significant major accident and disaster effects

Activity	Effect	Receptors
Major accidents associated with the Proposed Works resulting from a fire/ explosion and caused by accidental release of substances	Serious or fatal injuries to human populations. Serious harm to or contamination of non-human receptors.	Human receptors Historic environment receptors
Major accidents associated with the Proposed Works. An accidental release of hazardous chemical(s) or firewater run-off contaminated with Dangerous Substances	Serious or fatal injuries to human populations. Serious harm to or contamination of non-human receptors.	Human receptors Water and land receptors
Run-off of contaminated fire water from non-process/non-rad fire/explosion (e.g., building fires) associated with the Proposed Works.	Serious harm to or contamination of non-human receptors.	Water and land receptors
Major accidents caused by physical effects associated with the Proposed Works, (structural collapse, impact, dropped or swung load, high energy pipe/ equipment failure, collapse of excavation).	Serious or fatal injuries to human populations. Serious harm to or contamination of non-human receptors.	Human receptors Historic environment receptors
Natural disasters where the Proposed Works have a material effect on the extent and severity of the disaster	Serious or fatal injuries to human populations. Serious harm to or contamination of non-human receptors.	Human receptors Water and land receptors
Major accidents caused by events external to the decommissioning where the Proposed Works have a material effect on the extent and severity of the accident. This includes aircraft crash, projectiles, domino effects from an industrial accident in the vicinity, and loss of key utility (power supply, water	Serious or fatal injuries to human populations. Serious harm to or contamination of non-human receptors.	Human receptors Water and land receptors and historic environment receptors

Activity	Effect	Receptors
supply) and this excludes security, cyber-security and malicious acts.		

18.8.9. Each major accident listed in **Table 18-**Table 18- was assessed with the temporal effects of the Proposed Works being considered. These are included within the assessment in the Appendix but summarised as follows:

- It was identified that all activities listed in **Table 18-** are relevant during the Preparations for Quiescence phase of the project, which is expected to last for approximately 13 years. This is due to the presence of combustible and explosive materials being stored on the Site, alongside potential uses of firewater and also the presence of workers on the Site.
- During the Quiescence phase, the only credible MA&Ds to be considered are natural disasters. This is due to the reduction in human receptors in the Works Area, and the reduction in stored chemicals and fuels.
- During Final Site Clearance, most of the activities are relevant although the inventories of hazardous materials are significantly reduced when compared to the Preparations for Quiescence phase.

18.8.10. No transboundary effects were identified at scoping or scoped in for assessment.

18.9 Assessment of effects

18.9.1. The summary of the assessment as to whether the scoped in scenarios are significant can be found in **Table 18-10** below.

18.9.2. The full explanation of results with justifications can be found **Appendix 18B.**

18.9.3. The summary of the assessment as to whether the scoped in scenarios are significant can be found in **Table 18-10** below.

Table 18-10 - Summary table of significance for scoped in scenarios

Activity	Potentially affected receptors	Significance
Major accidents associated with the Proposed Works resulting from a fire/ explosion and caused by accidental release of substances	Human receptors	Not significant
	Historic environment receptors	Not significant
Major accidents associated with the Proposed Works.	Human receptors	Not significant
An accidental release of hazardous chemical(s) or firewater run-off contaminated with Dangerous Substances	Water and land receptors	Not significant

Activity	Potentially affected receptors	Significance
Run-off of contaminated fire water from non-process/ non-rad fire/ explosion (e.g., building fires) associated with the Proposed Works.	Water and land receptors	Not significant
Major accidents caused by physical effects associated with the Proposed Works, (structural collapse, impact, dropped or swung load, high energy pipe/ equipment failure, collapse of excavation).	Human receptors Historic environment receptors	Not significant Not significant
Natural disasters where the Proposed Works have a material effect on the extent and severity of the disaster	Human receptors Water and land receptors	Not significant Not significant
Major accidents caused by events external to the decommissioning where the Proposed Works have a material effect on the extent and severity of the accident. This includes aircraft crash, projectiles, domino effects from an industrial accident in the vicinity, and loss of key utility (power supply, water supply) and this excludes security, cyber-security and malicious acts.	Human receptors Water and land receptors Historic environment receptors	Not significant Not significant Not significant

18.10 Assessment of cumulative effects

Inter-Project Effects

18.10.1. There is the potential for major accident and disaster effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence (ZoI) applicable to each environmental aspect.

18.10.2. An assessment of inter-project effects is considered in **Chapter 21: Cumulative Effects Assessment of this ES**.

Intra-Project Effects

The assessment has inherently considered intra-relationship effects with other topics being assessed as part of the EIA which have the potential to lead to a risk event or to affect identified receptors e.g. the potential for a loud noise to occur during a structural collapse that kills several workers.

18.11 Summary

18.11.1. On the basis of the implementation of the embedded measures and good practice, no likely significant effects arising from Major Accidents and Disasters have been identified.

19

Conventional Waste

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19 Conventional Waste

19.1 Introduction

19.1.1. This chapter presents the assessment of the likely significant effects of the Proposed Works with respect to the potential impacts of conventional waste management during the Proposed Works and should be read in conjunction with the description provided in **Chapter 2: The Decommissioning Process**.

19.1.2. The focus of the waste assessment will be on the ability and capacity of existing waste management infrastructure to accommodate waste generated by the Proposed Works. The assessment will consider the role and function of existing and proposed on-site facilities in the context of overall waste management. The proposed waste assessment scope for the Environmental Statement (ES) does not include specific assessment of the potential effects of waste management in the context of the environmental aspects in the bullet points below as these are assessed within the relevant individual environmental aspect chapters:

- **Chapter 6: Air Quality**;
- **Chapter 11: Surface Water and Flood Risk;**
- **Chapter 12: Soils, Geology and Hydrogeology;**
- **Chapter 15: Noise and Vibratio**n; and
- **Chapter 16: Traffic and Transport**.

19.1.3. Radiological effects, including radioactive waste are considered within **Chapter 20: Radioactive Waste and Discharges** and are therefore excluded from this assessment.

19.1.4. Moreover, aqueous discharges are considered within **Chapter 11: Surface Water and Flood Risk** and **Chapter 10: Coastal Management and Water Quality** and are also therefore also excluded from this assessment.

19.1.5. Furthermore, the assessment of contaminated soils and materials is addressed in **Chapter 12: Soils, Geology and Hydrogeology**. Only the effects of contaminated soils and waste materials requiring off-site disposal are within the scope of the waste assessment set out in this chapter.

19.1.6. This chapter is supported by the following appendices provided in Volume III of this ES:

- **Appendix 19A: Material and Resource Use**

19.2 Relevant legislation, policy and technical guidance

Legislation

19.2.1. The legislation in **Table 19-1** is relevant to the assessment of the effects on conventional waste receptors.

Table 19-1 - Legislation relevant to conventional waste receptors

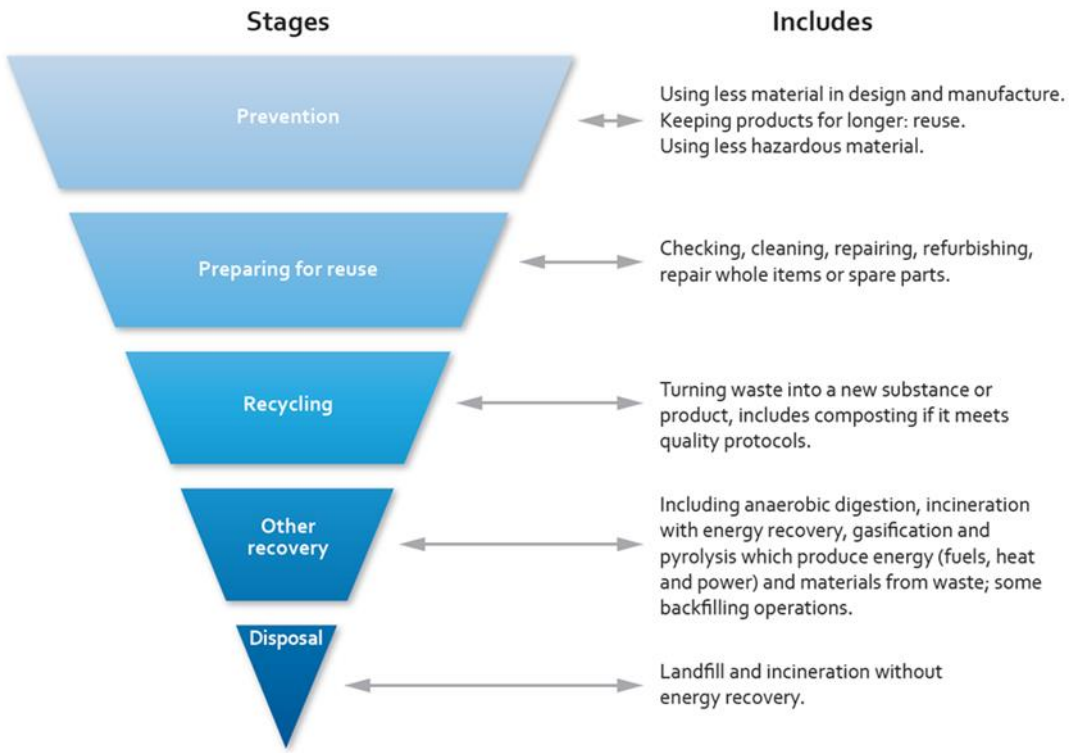
Legislation	Legislation Issue
Environmental Protection Act 1990 (EPA)[1]	The Environmental Protection Act 1990 (EPA) succeeded the Control of Pollution Act 1974 (COPA) and introduced new regulations for improved management systems relating to waste and pollution. The EPA establishes legal responsibilities for pollution control for land, air and water. In respect of waste, the EPA defines the fundamental structure and authority for waste management and control of emissions into the environment.
The Waste (England and Wales) Regulations 2011[2]	The Waste (England and Wales) Regulations 2011 are laws that require businesses to apply the waste management hierarchy when transferring waste.
Hazardous Waste (England and Wales) Regulations 2005 (as amended)[3]	The Hazardous Waste Regulations 2005, as amended, perform the following functions: ▪ replaces the Special Waste Regulations 1996; ▪ provides the definition of Hazardous Waste; ▪ regulates safe management of hazardous waste; ▪ sets out requirement for cradle to grave documentation of movement of hazardous waste; and ▪ collectors of hazardous waste must keep thorough records and provide the Environment Agency with quarterly returns.

Policy

19.2.2. The principal objective of sustainable waste and material resource management is to use material resources more efficiently. The management of waste in accordance with a clearly defined hierarchy forms a fundamental cornerstone of waste planning and management policy (see **Graphic 19-1**). Application of the principles laid down in the waste hierarchy model seek to minimise the quantity of waste that requires final disposal and by seeking to divert waste from requiring final disposal, to reduce the impact of operational and future developments on waste management facilities.

[1] UK Government (1990). Environmental Protection Act 1990 (Online). Available at: Environmental Protection Act 1990 (legislation.gov.uk) (Accessed August 2024).
[2] UK Government (2011). The Waste (England and Wales) Regulations 2011 (Online). Available at: The Waste (England and Wales) Regulations 2011 (legislation.gov.uk) (Accessed August 2024).
[3] UK Government (2005). The *Hazardous Waste (England and Wales) Regulations 2005* (Online). Available at: The Hazardous Waste (England and Wales)Regulations 2005 (legislation.gov.uk) (Accessed August 2024).

Graphic 19-1 - The waste hierarchy[4]



19.2.3. A summary of the relevant policies is given in **Table 19-2**.

Table 19-2 - Policy relevant to conventional waste

Policy Reference	Policy Relevance
National policy	
National Planning Policy for Waste[4]	The National Planning Policy for Waste (NPPW) sets out detailed waste planning policies and the government's ambition to work towards a more sustainable and efficient approach to resource use and management. Section 5, paragraph 8 of the NPPW sets out a number of points that local planning authorities should ensure when determining planning applications for non-waste development. This includes ensuring that "*the likely impact of proposed, non-waste related development on existing waste management facilities, and on sites and areas allocated for waste management, is acceptable and does not prejudice the implementation of the waste hierarchy and/or the efficient operation of such facilities; new, non-waste development makes sufficient provision for waste management and promotes good design*

[4] UK Government (2014) National Planning Policy for Waste 2014 (Online). Available at: National planning policy for waste - GOV.UK (www.gov.uk). (Accessed August 2024).

Policy Reference	Policy Relevance
	to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape; the handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities, and minimises off-site disposal."
National Planning Policy Framework[5]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development. The NPPF references three overarching objectives of the planning system – an economic objective, a social objective and an environmental objective. The latter of these specifically refers to the minimisation of waste and prudent use of natural resources. Paragraph 4 states that the NPPF should be read in conjunction with government planning policy for waste, which provides specific waste management policy for England. The NPPF is supported by the Planning Practice Guidance (PPG) which, together with the NPPF, sets out the Government's overall planning policy framework. The two documents are intended to be read together. Specific guidance is set out in relation to waste, which was published in October 2015[6]. This provides further information in support of the implementation of waste planning policy. Nuclear decommissioning process requires dismantling and demolition of systems, components and buildings on site to the point that it no longer requires measures for radiation protection. Whilst noting the above, the NPPF and associated PPG, need to be considered in the context of the application.
The Waste Management Plan for England (2021)[7]	The Waste Management Plan for England is an analysis of the current waste management situation in England. The plan does not introduce new policies or change how waste is managed. It aims to bring current waste management policies together under one national plan. Of most relevance to the Proposed Works is the section which provides more information on waste management in England, and in particular the waste hierarchy. There is also a section within the plan on 'the assessment of need for new collection schemes and infrastructure, the closure of waste infrastructure, including an assessment of the investments and other financial means'. This section seeks to support local authorities to facilitate the provision of necessary waste infrastructure and speed up the process.

[5] UK Government (2023) National Planning Policy Framework. (Online) Available at: National Planning Policy Framework - GOV.UK (www.gov.uk) (Accessed August 2024).
[6] UK Government (2015). Planning Practice Guidance – Waste (Online) Available at: Waste - GOV.UK (www.gov.uk) (Accessed August 2024).
[7] UK Government (2021). Waste Management Plan for England (Online). Available at: Waste Management Plan for England (publishing.service.gov.uk) (Accessed August 2024).

Policy Reference	Policy Relevance
Our Waste, Our Resources: A strategy for England (2018)[8]	This strategy sets out how material resources will be preserved by minimising waste, promoting resource efficiency and moving towards a circular economy in England. It has two overarching objectives: • "*to maximise the value of resource use; and* • *to minimise waste and its impact on the environment.*" The objectives are supported by five strategic principles, which aim to deliver the overarching objectives. The most relevant of these to the Proposed Works is "*to ensure that those who place on the market products which become waste to take greater responsibility for the costs of disposal – the 'polluter pays' principle.*"
A Green Future: Our 25 Year Plan to Improve the Environment (2018)[9]	The 25 Year Environment Plan sets out government action to help the natural world regain and retain good health. One of the key aims of the plan is to minimise waste in order to manage pressures on the environment. Chapter 4: Increasing resource efficiency and reducing pollution and waste is considered to be of greatest relevance to the Proposed Works.
Environmental Improvement Plan 2023 (2023)[10]	The Environmental Improvement Plan 2023 is the first revision of the 25 Year Environment Plan (25YEP). It builds on the 25YEP vision and sets out the progress made against the ten goals set out in the 25YEP, and the plan to continue to deliver on these. Goal 5 is relevant to the Proposed Works and is to "*minimise waste, reuse materials as much as we can and manage materials at the end of their life to minimise the impact on the environment*".
Local policies	
Somerset Adopted Waste Core Strategy Development Plan Document up to 2028 (2013)[11]	The Waste Core Strategy Development Plan Document sets out the County Council's approach to planning for sustainable waste management in Somerset until the year 2028. Policy SD1 (Presumption in favour of sustainable development) states that when considering development proposals, the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF. It seeks to secure development that improves the economic, social and environmental conditions in the area. Policy WSC1 (Waste prevention) seeks to maximise the scope for waste prevention. It includes a number of requirements for proposed developments in order to achieve this.

[8] UK Government (2018). Our Waste, Our Resources: A strategy for England (Online). Available at: Our waste, our resources: a strategy for England (publishing.service.gov.uk) (Accessed August 2024).
[9] UK Government (2018). 25 Year Environment Plan (Online). Available at: 25-year-environment-plan.pdf (publishing.service.gov.uk) (Accessed August 2024).
[10] UK Government (2023). Environmental Improvement Plan 2023 (Online). Available at: Environmental Improvement Plan (publishing.service.gov.uk) (Accessed August 2024).
[11] Somerset County Council (2013). Waste Core Strategy (Online). Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Waste/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FWaste%2FSomerset%20Waste%20Core%20Strategy%2Epdf&parent=%2Fsites%2FSCCPublic%2FWaste&p=true&ga=1 (Accessed August 2024).

Policy Reference	Policy Relevance
	Policy WSC2 (Recycling and reuse) supports development that maximises reuse and / or recycling of waste, subject to proposals being in accordance with the Planning Authority's Development Management Policies. It also encourages the provision of adequate space and facilities – both within buildings and externally - that enables effective separation, temporary storage and collection of waste. Finally, the policy requires applications for all types of development to demonstrate that viable opportunities to minimise construction and demolition waste disposal will be taken, making use of existing industry codes of practice and protocols, site waste management plans (as detailed in strategic policy WCS1) and relevant permits and exemptions issued by the Environment Agency.
Adopted West Somerset Local Plan to 2032 (2016)[12]	The West Somerset Local Plan includes policies which guide the sustainable development of the parts of West Somerset District outside the Exmoor National Park. Policy SD1 (Presumption in favour of sustainable development) states that when considering development proposals, the Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the NPPF. It seeks to secure development that improves the economic, social and environmental conditions in the area. It goes on to advise that planning applications which accord with the policies in the local plan will be approved without delay.
Somerset West and Taunton Local Plan 2040 Issues and Options Document (consultation document) 2020[13]	Somerset West and Taunton Council (SWT) had made some progress on their Local Plan 2040 review before the announcement that the Councils in Somerset would become a unitary authority, with an issues and options consultation having taken place in March 2020. Whilst a plan for Somerset West and Taunton will now not progress, the Council's website advises that the earlier work is still relevant to the forthcoming Somerset Local Plan. Within the issues and options consultation document, a number of policy approaches were proposed in order to meet Objective 1 – to ensure all new development works towards the district's "carbon neutrality by 2030" target. This included maximising the efficiency and convenience of recycling.

[12] West Somerset Council (2016). Adopted West Somerset Local Plan to 2032 (Online). Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Planning%20and%20Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSWT%20%2D%20West%20Somerset%20Local%20Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy&p=true&ga=1 (Accessed August 2024).

[13] Somerset Council (2020). Somerset West and Taunton Local Plan 2040 Issues and Options Document (Online). Available at: https://somersetcc.sharepoint.com/sites/SCCPublic/Planning%20and%20Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSomerset%20West%20and%20Taunton%20Local%20Plan%202040%20Review%2Fissues%20and%20options%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning%20and%20Land%2FPlanning%20Policy%2FSomerset%20West%20and%20Taunton%20Local%20Plan%202040%20Review&p=true&ga=1 (Accessed August 2024).

Policy Reference	Policy Relevance
	Issue 5.4.1 is setting a strong economic growth target. The supporting text to this issue states that "*Development that supports the circular economy of eliminating waste and the continual use of resources is important in mitigating climate change and minimising plastic waste and its harm on our environment.... For this reason, we will include a policy within the Local Plan that encourages and supports growth of these Sectors*".

Technical guidance

19.2.4. A summary of the technical guidance relevant to conventional waste is given in **Table 19-3**.

Table 19-3 - Technical Guidance relevant to conventional waste

Technical Guidance	Context
Materials and Waste in Environmental Impact Assessment (2020)[14]	The IEMA guide to Materials and Waste in Environmental Impact Assessment offers guidance and recommendations for EIA practitioners and stakeholders concerns with the impacts and effects of materials and waste on the environment.
Duty of care: code of practice for managing controlled waste (2016)[15]	This code provides guidance on how to meet waste duty of care requirements in England and Wales. The code applies to any party who imports, produces, carries, keeps, treats, disposes of or, as a dealer or broker has control of, certain waste in England.
Guidelines for Environmental Impact Assessment (2016)[16]	This guide sets out key principles and direction to ensure that environmental mitigation identified during the pre-application assessment process (including design and EIA) is delivered once consent has been granted.
Site Waste Management Plans 2008 (revoked in 2013 but still considered to be best practice)[17]	This covers the requirements for a site waste management plan including preparation, content, reviews and updates, records and the duties of the Applicant and principal contractor. These (now revoked) regulations set out a baseline standard for a site waste management plan.

[14] Institute of Environmental Management and Assessment (IEMA) (2020*). IEMA Guide to: Materials and Waste in Environmental Impact Assessment*. IEMA
[15] UK Government (2016). Waste duty of care code of practice (Online). Available at: Waste duty of care: code of practice (accessible version) - GOV.UK (www.gov.uk) (Accessed August 2024).
[16] Institute of Environmental Management and Assessment (IEMA) (2016) Environmental Impact Assessment Guide to: Delivering Quality Development (Online). Available at: Delivering-Quality-Development.pdf (Accessed August 2024).
[17] UK Government (2008). The Site Waste Management Plans Regulations 2008 (Online). Available at: The Site Waste Management Plans Regulations 2008 (legislation.gov.uk) (Accessed August 2024)

19.3 Data gathering methodology

Study Area

19.3.1. The Study Area for the conventional waste assessment focuses on the administrative area of the appropriate Waste Planning Authority (WPA), which in this case is Somerset Council (formerly Somerset County Council (SCC)).

19.3.2. This is because, whilst waste will always flow across WPA boundaries for management, treatment and where appropriate, disposal, WPA's seek to be self-sufficient in waste management terms and make provision for the equivalent of their locality's waste arisings.

Desk study

19.3.3. The waste assessment has been undertaken with reference to **Chapter 2: The Decommissioning Process**, supported by a number of publicly available data sources. The principal data sources used to inform this chapter for potential effects comprise of the following:

- The Somerset Waste Core Strategy – Development Plan Document up to 2028[11];
- Supporting evidence of the Somerset Waste Core Strategy such as Topic Paper 1: Waste Management Needs to 2028[18]; and
- Minerals and Waste Annual Monitoring Report 2016 to 2019[19].

19.3.4. These data sources have been used to establish existing and future waste management needs across Somerset.

Survey work

19.3.5. Due to the quantitative nature of the waste impact assessment and its reliance on publicly available data sources, the assessment has been based upon published data sources only and has not necessitated the carrying out of any survey work.

19.4 Consultation

Overview

19.4.1. In respect of the waste impact assessment, it is considered that no additional consultation outside the formal statutory consultation activities associated with the preparation and production of the ES are required.

[18] Somerset County Council (2012). Waste topic paper 1: Waste Management Need to 2028 (Online). Available at: SCC - Public - Waste Management Need to 2028.pdf - All Documents (sharepoint.com) (Accessed August 2024).
[19] Somerset County Council (SCC) Minerals and Waste Annual Monitoring Report 2016 to 2019 (Online). Available at: SCC - Public - Somerset Authority Monitoring Report for Waste and Minerals 2016-19.pdf - All Documents (sharepoint.com) (Accessed August 2024).

19.4.2. Any applications required to vary environmental permits associated with the management of conventional waste will involve statutory consultation. These are subject to their own statutory procedures and regulation and consultation will reflect the provisions of these as necessary.

Pre-application Opinion

19.4.3. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the responses relevant to conventional waste, received in the Pre-Application Opinion is presented in **Table 19-4.**

Table 19-4 - Summary of Pre-application Opinion Responses

Paragraph Reference	Consideration	How addressed in the ES
Page 24	In Chapter 18 (Conventional Waste) paragraphs 18.2.5 and Table 18.3 of technical guidance do not include the IEMA guide to: Materials and Waste in Environmental Impact Assessment (2020) or the Design Manual for Roads and bridges, LA110 Material assets and waste (2019). These guidance documents provide criteria for significance and magnitude of effect. The Scoping Report does not provide any justification of how / why the significance or magnitude has been decided and the criteria is not clear. Typically, a percentage of capacity occupied is used rather than a m3 volume of waste generated. The IEMA and DMBR guidance should be considered as part of the EIA methodology. If they are not to be used, a justification should be provided in the ES.	The IEMA guide has been considered as part of the EIA methodology and reference is provided (see the Section 19.7 Assessment Methodology). Design Manual for Roads and bridges and LA110 Material assets and waste (2019) provides guidance in relation to motorways and trunk roads and as such is considered to be of limited relevance to the Proposed Works.
Page 25	In Chapter 18 (Conventional Waste) one study area is defined for the EIA. The 'IEMA guide to: Materials and Waste in Environmental Impact Assessment (2020) / the Design Manual for Roads and bridges, LA110 Material assets and waste (2019)' defines two study areas – one is the area of which the waste will be generated (typically a red line boundary), the second is an area sufficient to make an assessment of capacity and availability of infrastructure to handle the waste; typically a county and / or region. Using one study area may not be sufficient to make an adequate assessment.	Justification for the Study Area chosen is provided in **Section 19.3** Data gathering methodology (Study Area).

19.4.4. In response to a specific point in the ONR Pre-application Opinion (see **Appendix 5A**; Section 3.1, paragraph 15), for further consideration of material and resource use. **Appendix 5B** presents the relevant baseline assessment and associated conclusions. With reference to material and resource use, the technical note concludes that on a precautionary basis, material resource use is scoped into the Environmental Statement. This assessment is presented in **Appendix 19A**.

Non-statutory consultation

19.4.5. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

19.4.6. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

19.4.7. Responses to both the first and second rounds of non-statutory engagement are presented in the Consultation Feedback Report. Comments relevant to the conventional waste assessment are summarised in **Table 19-5.**

Table 19-5 – Comments received during non-statutory consultation relevant to the conventional waste assessment

Respondent	Comment received	Response
Round 1 consultation		
Member of the public	Request for information on the quantities of radioactive and conventional wastes that will be produced during decommissioning.	Quantities of conventional waste are within the scope of this chapter and are considered in **Section 19.10**.
Round 2 consultation		
Somerset Council	It is noted that, whilst it is expected that material from demolition activities during the Preparations for Quiescence and Final Site Clearance will provide enough suitable materials for use on site to fill voids during the dismantling of plant and structures, a worst-case scenario has been presented involving the importation of materials during the Preparations for Quiescence phase.	An assessment of material and resource use is provided in **Volume III, Appendix 19A** of this **ES**.
Somerset Council	Whilst it is unclear what volumes of materials may be imported, these engineering works may require planning consent and early engagement with the Somerset Council Planning Service is encouraged.	A preliminary technical engagement meeting covering waste was held with Somerset Council 12 June 2024. The Applicant will continue to engage with Somerset Council Planning Service in relation to the Proposed Works.

Technical engagement

19.4.8. **Table 19-6** summarises the technical engagement that has been undertaken in relation to the conventional waste assessment.

Table 19-6 - Technical Engagement undertaken in relation to the conventional waste assessment

Stakeholder	Meeting date	Points discussed
Somerset Council	12 June 2024	To provide further detail with respect to the Proposed Works and report the findings of the assessment

19.5 Overall baseline

Current baseline

19.5.1. The Hinkley Point B (HPB) Nuclear Power Station produces a limited amount of non-radioactive wastes each year, which are managed and controlled under the Duty of Care Regulations[17]. The site operates with an ISO14001 certified waste management procedure and dedicated Site Waste Co-ordinator who is Suitably Qualified and Experienced Personnel (SQEP) at ensuring waste is consigned off site correctly and in turn implementing waste hierarchy. Equivalent arrangements under the NRS integrated management system will be adopted.

19.5.2. Where possible, wastes (such as inert waste, metal, cardboard and wood) are segregated and sent off-site for reuse or recycling. The bulk of the remaining waste is sent off-site for disposal.

19.5.3. Certain wastes, such as oil, oily materials, aerosols and chemicals are managed and disposed of under the more onerous requirements of the Hazardous Waste (England and Wales) Regulations 2005[3].During the generation phase, the bulk of this was oily material and, where possible, oil was sent off-site for recycling. All conventional waste presently sent off-site for reuse, recycling or final disposal is despatched to facilities primarily located either within the Waste Planning Authority (WPA) area catchment (i.e. Somerset), or for more specialist wastes such as hazardous materials, within the wider region (i.e. the South West). Importantly, the WPA has a statutory duty to provide for an appropriate amount of waste infrastructure capacity to be available over a defined time period according to projected waste arisings, to meet national and European targets to divert waste from landfill, and to adhere to regulatory requirements with regard to the separate collection of waste types (as part of their statutory development plans).

19.5.4. Provision for existing and future waste management needs across Somerset is set out in the Waste Core Strategy for Somerset[11]. This strategy is underpinned by an evidence base relating to existing waste management capacities. The latest update is set out in the Minerals and Waste Annual Monitoring Report 2016 to 2019[19].

19.5.5. The current evidence base (2016-2019) records 106 operational waste facilities across the Somerset area (of which 6 can manage hazardous wastes), with a further 13 waste facilities permitted. Together, these facilities provide waste management capacity for inert, non-hazardous and hazardous waste streams.

19.5.6. The baseline waste site capacity information published in the Waste Core Strategy[11] was informed by Waste Topic Paper 1 – Waste Need Assessment[18]. Topic Paper 1 reported estimated capacity in 2011 – a position that has since been updated to reflect the December 2019 position. **Table 19-7** summarises the latest available capacity data for Somerset.

Table 19-7 - Latest Available Capacity Data for Somerset

Facility Type	Capacity as set out in the 2013 Waste Core Strategy[11]	Capacity as set out in the 2016 to 2019 Annual Monitoring Report[19]	
Non-landfill:	**Capacity (tonnes per annum)**	**Capacity (tonnes per annum)**	
Recycling	1,213,603	1,952,477	
Other recovery	45,000	175,000	
Landfill:	**Capacity (cubic metres)**	**Capacity (cubic metres)**	**2019 inputs (tonnes)**
Non-hazardous landfill	5,146,000	2,017,234	200,000
Inert landfill	900,000	0	170,600 (deposited at non-hazardous landfills as no inert capacity)
Hazardous landfill (asbestos only cell part of an existing non-hazardous landfill)	*(no separate data available – forms part of non-hazardous capacity)*	*(no separate data available – forms part of non-hazardous capacity)*	9,880

Future baseline

19.5.7. In the absence of the Proposed Works, there are unlikely to be any notable changes to the existing waste infrastructure capacity. The end points to which different waste types are directed may, however, change in line with national targets. It is therefore assumed that similar levels of waste capacity to the existing baseline will be made available to manage wastes during the Final Site Clearance phase of the Proposed Works.

19.6 Embedded environmental measures

19.6.1. **Table** 19-8 outlines the embedded environmental measures proposed to reduce the potential effects relevant to conventional waste.

Table 19-8 - Summary of Embedded Environmental Measures

Embedded Measure	Compliance Mechanism
As part of an Integrated Site Management Plan, waste specific management procedures will be developed for the Proposed Works, which seeks to re-enforce the principles of the waste management hierarchy i.e. reduce the amount of waste generated where possible; maximise the reuse and recycling of waste; and then only send waste for final disposal if all other alternatives have been exhausted.	Environmental Management Plan (EMP)

19.7 Assessment methodology

19.7.1. The proposed generic project-wide approach to the assessment methodology is set out in **Chapter 5: The EIA Process**, and specifically in **Section 5.3** and **Section 5.4**. However, whilst this has informed the approach that has been used in this conventional waste chapter, it is necessary to set out how this methodology will be applied, and adapted as appropriate, to address the specific needs of the conventional waste assessment in the ES.

General approach

19.7.2. Guidance on how to assess the likely significant effects of waste generation from the Proposed Works is set out in the Institute of Environmental Management and Assessment (IEMA) guide to Materials and Waste in Environmental Impact Assessment[16]. The proposed assessment methodology is based on this guidance as well as professional judgement and experience with the application of EIA to decommissioning projects – in the context of prevailing relevant waste management legislation, policies and guidance applicable to the Proposed Works.

19.7.3. For the assessment of waste impacts, assumptions regarding the type and quantity of waste requiring management have been applied. Following this, the type and quantity of materials requiring off-site treatment and / or disposal has been assessed in relation to the projected capacity in the Study Ares. Importantly, this has been based on the effects that the management of waste from the Proposed Works would have on existing and committed waste infrastructure in the Study Area. Assessment is made on the scale of the additional burden that waste requiring management would have on the available capacity within the Study Area.

Determination of significance

19.7.4. The significance of an effect resulting from a development is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.

19.7.5. Other summaries of significance assessments in other chapters of this Scoping Report include consideration of ‘sensitivity’. This is where the value of a receptor may be ranked, for example a nationally significant ecological designation versus a locally important one. In respect of the receptors identified for the waste impact assessment, there is no distinction between the importance

of different types of waste management capacity. As such, no receptor sensitivity or value will be considered in this assessment.

19.7.6. Thresholds of magnitude have, however, been established and these are set out in **Table 19-9** These thresholds are based on whether the burden equates to:

- the need to construct a new waste management facility (major);
- the need for an extension to existing infrastructure (moderate); or
- whether the additional waste could be adequately managed by the existing network of waste management capacity (minor and negligible).

19.7.7. **Table 19-9** details the basis for assessing receptor sensitivity.

Table 19-9- Establishing the magnitude of change for receptors

Sensitivity	Criteria	Receptor type
Major negative	Net increase in waste arisings relative to the future baseline leading to a severe national and regional scale reduction in landfill void space or a severe capacity gap in treatment infrastructure within the spatial scope. Need for additional large-scale waste treatment and/or disposal capacity of: ■ Greater than 250,000 tonnes per annum for non-hazardous waste; ■ Greater than 100,000 tonnes per annum of hazardous waste; or ■ Greater than 10,000,000 tonnes per annum of inert waste. Effect many be judged to be of importance in the planning context and, therefore, of potential concern to a project depending upon the importance attached to the issue in the decision-making.	All waste receptors (see **Table 19-10**)
Moderate negative	Net increase in waste arisings relative to the future baseline leading to regional scale reduction in landfill void space or a capacity gap in treatment infrastructure within the spatial scope. Need for additional large-scale waste treatment and/or disposal capacity of: ■ Between 50,000 and 250,000 tonnes per annum for non-hazardous waste; ■ Between 20,000 and 100,000 tonnes per annum of hazardous waste; or ■ Between 2,000,000 tonnes and 10,000,000 per annum of inert waste. Effect may be judged to be of importance in the planning context (for example where effects are permanent or long-term and the effect on local waste treatment and disposal infrastructure is such that additional capacity may be required).	All waste receptors (see **Table 19-10**)
Minor negative	Net increase in waste arisings relative to the future baseline leading to regional scale reduction in landfill void space or a capacity gap in treatment infrastructure within the spatial scope. Need for additional large-scale waste treatment and/or disposal capacity of: ■ less than 50,000 tonnes per annum for non-hazardous waste;	All waste receptors (see **Table 19-10**)

Sensitivity	Criteria	Receptor type
	▪ less than 20,000 tonnes per annum of hazardous waste; or ▪ less than 2,000,000 tonnes per annum of inert waste. Effect is of low importance in the decision-making process but may be of relevance to the detailed design and mitigation of a project.	
Negligible	No increase in waste arisings relative to the future baseline or reduction in landfill void space capacity for landfill void space or a capacity gap in treatment infrastructure in the spatial scope. No appreciable positive or negative effects.	All waste receptors (see **Table 19-10**)
Positive	Net reduction in waste arisings and diversion of waste from landfill relative to the future baseline resulting in an environmental improvement. Positive effect on waste arisings overall and available capacity in landfill void space or in treatment infrastructure.	All waste receptors (see **Table 19-10**)

19.7.8. For most assessments, sensitivity of the receptor + the magnitude of the likely impact = the level of significance of effect. However, as noted above, no receptor sensitivity has been applied in this assessment. As such, for the purposes of this assessment, the overall conclusions on significance are based entirely on the predicted magnitude of effect. Where the magnitude of effects is deemed to be Major and Moderate the overall impact will be Significant. Minor or Negligible effects are deemed to be Not Significant.

19.8 Assumptions and limitations

19.8.1. The following assumption applies in this waste assessment chapter:

- All waste activities will be carried out in accordance with the relevant environmental regulatory requirements, for example, waste transferred off-site will be handled by a registered waste carrier under authorisation by the Environment Agency. This waste would be taken to a permitted or exempt facility authorised to receive and handle that waste under Duty of Care arrangements.

19.8.2. The following limitations are also noted:

- In the absence of any clearly defined thresholds relating to the magnitude of effect, professional judgement must be applied.
- the baseline data presented in this assessment relating to existing waste management capacities and throughputs represents the picture at a fixed point in time. Capacities and throughputs are continually changing as new facilities come on stream or are closed. Similarly, throughputs are linked to economic activity and changing patterns of disposal are commonplace. To reflect this, underpinning data on capacities and disposals is updated on an annual basis.

19.9 Scope of the assessment

Scope of waste types considered

19.9.1. Before waste assessment receptors can be identified, it is important to establish the types of waste that the Proposed Works could generate. This is because the types of waste that will require management will have a direct bearing on the receptors considered in his assessment.

19.9.2. All conventional waste is categorised by the Environment Agency as being either inert; non-hazardous; or hazardous. With this in mind, the following types of inert, non-hazardous and hazardous waste which may be generated by the Proposed Works are considered to come from the following key sources:

- excavation waste, including soils and made ground etc.;
- demolition wastes including materials such as rubble and brick, wood, glass, metals, asbestos contaminated material, lagging etc.;
- construction waste relating to the provision of any new facilities; and
- decommissioning staff waste, including food waste, general refuse and paper / card, metals etc.

19.9.3. Within these sources of waste arisings from the Proposed Works, material may be inert, non/hazardous or hazardous – for example: demolition material can comprise clean / inert rubble, non-hazardous metals and hazardous wastes such as asbestos.

19.9.4. Arisings of excavation materials which are suitable for beneficial use on-site without treatment (e.g. inert materials) are not within the scope of this assessment, only those fractions treated as waste or requiring off-site disposal and therefore within the scope of the assessment.

Potential receptors

19.9.5. The conventional waste assessment addresses the permanent effects of the waste that would be generated by the Proposed Works. The assessment considers the types of waste that will be generated and evaluated the effects that the management of these wastes will have on the existing and committed network of waste management infrastructure in the Study Area. Specifically, the focus on this assessment will be on the capability and capacity of the existing and committed network of waste management facilities to accommodate the quantity and types of waste that will potentially be generated.

19.9.6. The associated effects of managing waste per se (for example, transportation of wastes, any effects on amenity from deconstruction activities and operation of waste processing facilities on-site) will not be considered in this assessment and are covered within **Chapter 6: Air Quality**, **Chapter 15: Noise and Vibration** and **Chapter 16: Traffic and Transport**.

19.9.7. **Table 19-10** sets out the receptors that form the focus of this assessment.

Table 19-10 - Receptors Subject to Potential Effects

Receptor	Reason for Consideration
Conventional waste: Third party (off-site) inert waste facilities	Existing and planned waste management capacity within spatial scope (using total capacity reported in relevant Somerset policy).
Conventional waste: Third party (off-site) non-hazardous waste facilities	Existing and planned waste management capacity within spatial scope (using total capacity reported in relevant Somerset policy).
Conventional waste: Third party (off-site) hazardous waste facilities	Existing and planned waste management capacity within spatial scope (using total capacity reported in relevant Somerset policy).

Likely significant effects

19.9.8. The likely significant conventional waste effects that will be taken forward for assessment in the EIADR are summarised in **Table 19-11.**

Table 19-11 - Likely significant conventional effects

Receptor	Likely significant effects
Conventional waste: Third party (off-site) inert waste facilities	Full use of existing facilities within the Study Area and consequential need to seek additional treatment capacity.
Conventional waste: Third party (off-site) non-hazardous waste facilities	Full use of existing facilities within the Study Area and consequential need to seek additional treatment capacity.
Conventional waste: Third party (off-site) hazardous waste facilities	Full use of existing facilities within the Study Area and consequential need to seek additional treatment capacity.

19.10 Assessment of effects

Waste generation as part of the Proposed Works

19.10.1. As detailed in **Chapter 2: The Decommissioning Process**, the Proposed Works will be undertaken in three sequential phases, which will commence upon the completion of defueling:

- Preparations for Quiescence phase (to be carried out over a ~13 year period);
- Quiescence phase (~70-year period); and
- Final Site Clearance phase (~10 year period).

19.10.2. It is anticipated that the first stage – the Preparations for Quiescence phase - will result in the generation of several different types of waste, which will require off-site treatment/disposal. Detailed analysis of the types and quantities of waste that are likely to be produced has been prepared in conjunction with the Applicant. A summary of the anticipated waste arisings requiring off-site disposal are set out in **Table 19-12**. The focus of this waste assessment is on this first stage of the Proposed Works. The Quiescence phase is not anticipated to result in the generation of any notable quantities of waste and so has been scoped out of this assessment.

19.10.3. In terms of the Final Site Clearance phase, whilst this will result in the generation of some wastes as part of activities such as site remediation, reactor dismantling and Safestore deconstruction, it is anticipated that the quantities of waste will be much less than the quantity of non-hazardous and hazardous materials that will require off-site management in the Preparations for Quiescence phase which is therefore considered the worst-case. It is anticipated that some of the demolition material generated from Final Site Clearance activities will be suitable for use as infill material for voids.

Table 19-12 - Waste generation from the Proposed Works (Preparations for Quiescence phase) requiring off-site treatment or disposal

Waste type	Tonnage of waste requiring off-site disposal (years 1-13 of the Proposed Works)													
Years* **	***1****	***2***	***3***	***4***	***5***	***6***	***7***	***8***	***9***	***10***	***11***	***12***	***13***	***Total***
Inert*	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-hazardous**	468	2,829	9,501	8,875	8,875	8,254	6,867	1,894	4,144	2,698	3,504	7,607	1,140	66,656
Hazardous (including contaminated rubble)	91	237	425	324	324	392	211	55	335	493	1,137	1,396	247	5,668
TOTAL	**559**	**3,066**	**9,926**	**9,199**	**9,199**	**8,846**	**7,078**	**1,949**	**4,479**	**3,191**	**4,641**	**9,003**	**1,387**	**72,324**

**It is anticipated that ~17,000 tonnes of clean rubble will be generated on site but will remain on site and used as a fill material.*

***Of the non-hazardous material, this is anticipated to comprise 65% metals; 25% miscellaneous materials; and 10% glass, plastic and cables*

**** Year 1 of the programme is not anticipated to be a full calendar year.*

Conventional waste: Third party (off-site) inert waste facilities

19.10.4. As set out in **Table 19-12**, it is not anticipated that any clean, inert materials – predominantly rubble – will be despatched off-site for final disposal. Whilst it is anticipated that the Proposed Works will result in the generation of approximately 17,000 tonnes of inert material over the 13-year Preparations for Quiescence phase, all of this material will be retained on-site for use as infill. With this in mind, it is predicted that the Proposed Works will have a Negligible magnitude of impact on third party inert waste facilities in the Study Area, and as such, the predicted effect is **Not Significant**.

19.10.5. It is assumed that, as in the Preparations for Quiescence phase, no clean, inert rubble (i.e. brick and concrete) will be dispatched off-site for final disposal during the Final Site Clearance, as it will be retained on site as infill. Therefore, as the impact on inert waste facilities during the Preparations for Quiescence phase is concluded to **be Not Significan**t the lower quantities expected during the Final Site Clearance can be qualitatively assessed as **Not Significant**, based upon the assumption outlined in the future baseline.

Conventional waste: Third party (off-site) non-hazardous waste facilities

19.10.6. The increase in waste arisings brought about by the Proposed Works will lead to a greater requirement for treatment capacity at non-hazardous waste facilities in the Study Area relative to the current and anticipated future baseline position outlined in **Section 19.5** of this chapter. However, as set below, it is predicted that only ~67,000 tonnes of non-hazardous waste will be despatched off-site for final treatment / disposal over the 13-year Preparations for the Quiescence phase. In the worst-case year (year 3) ~9,500 tonnes of non-hazardous waste will require off-site management. Whilst it is recognised that non-hazardous landfill capacity in the Study Area is not in short supply – with over 2 million cubic metres of void remaining at the end of 2019 (see **Table 19-7**), it is also acknowledged that 65% of the non-hazardous waste arising from the Proposed Works comprises metals of varying types. As **Table 19-7** demonstrates, there is also almost 2 million tonnes of recycling capacity in the Study Area.

19.10.7. Finally, the predicted worst-case year for the generation of non-hazardous waste would result in ~9,500 tonnes of waste requiring management. This is significantly less than 50,000 tonnes per annum (the threshold of magnitude of impact set out in **Table 19-9** above), therefore, it is predicted that the Proposed Works will have a Minor Negative impact on third party non-hazardous waste facilities in the Study Area, and thus, the predicted effect is **Not Significant.**

19.10.8. As the impact on non-hazardous waste facilities during the Preparations for Quiescence phase is concluded to be **Not Significant**, the lower quantities expected during the Final Site Clearance can be qualitatively assessed as **Not Significant**, based upon the assumption outlined in the future baseline.

Conventional waste: Third party (off-site) hazardous waste facilities

19.10.9. The increase in waste arisings brought about by the Preparations for Quiescence phase of the Proposed Works will lead to a greater requirement for treatment capacity at hazardous waste facilities in the Study Area relative to the current and anticipated future baseline outlined in **Section 19.5** of this chapter. However, as set out in **Table 19-12**, it is predicted that ~5,700 tonnes of hazardous waste will be despatched off-site for final treatment / disposal over the 13-year period of this stage. In the worst-case year (12) ~1,400 tonnes of hazardous waste will require off-site

disposal. Whilst it is recognised that there is no hazardous landfill capacity in the Study Area (see **Table 19-7**), it is also acknowledged that there are sufficient alternative means to access waste management capacities – most notably transfer stations, which could accommodate the small quantities of hazardous waste to be generated by the Proposed Works. Indeed, hazardous waste management facilities are specialist facilities, which tend to serve regional, rather than local markets. In this context, it would not be unusual for any hazardous waste generated by the Proposed Works to be transferred out of the Study Area for final disposal.

19.10.10. Finally, the predicted worst-case year for the generation of hazardous waste would result in ~1,400 tonnes of waste requiring management. This is significantly less than 20,000 tonnes per annum (the threshold of magnitude of impact set out in **Table 19-9** above), therefore, it is predicted that the Proposed Works will have a **Minor Negative** impact on third party non-hazardous waste facilities in the Study Area, and thus, the predicted effect is **Not Significant**.

19.10.11. As the impact on hazardous waste facilities during the Preparations for Quiescence phase is concluded to be **Not Significant**, the lower quantities expected during the Final Site Clearance can be qualitatively assessed as **Not Significant**, based upon the assumption outlined in the future baseline.

19.11 Assessment of cumulative effects

Inter-Project Effects

19.11.1. There is the potential for conventional waste effects associated with the Proposed Works to interact with, or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

19.11.2. An assessment of inter-project effects is considered within in **Chapter 21: Cumulative Effects Assessment** of this ES.

Intra-Project Effects

19.11.3. Intra-project effects between conventional waste and traffic could arise as a consequence of conventional waste arisings requiring transportation off-site for final recovery or management.

19.11.4. However, all traffic effects (including the off-site transportation of waste) have been considered in full in **Chapter 16: Traffic and transport**. This assessment has concluded that the Proposed Works would give rise to no significant traffic effects. In this regard, it is not considered that the Proposed Works would give rise to any significant adverse intra-project effects.

19.11.5. In a similar vein, intra-project effects between conventional waste and air quality and noise could arise as a consequence of conventional waste arisings requiring handling and transportation off-site for final recovery or management.

19.11.6. However, all such effects have been considered in full in **Chapter 6: Air quality** and **Chapter 15: Noise and vibration** and no significant effects are identified.

19.12 Summary

Table 19-13 - Summary

Receptor	Summary of Predicted Effect	Magnitude of Change	Significance	Summary of Rationale
Conventional waste: Third party (off-site) inert waste facilities	No inert waste to be despatched off-site for final treatment/ disposal. All such material (~15,000 tonnes in total) to be managed on site.	Negligible	Not Significant	No inert waste is to be despatched off-site for disposal.
Conventional waste: Third party (off-site) non-hazardous waste facilities	~67,000 tonnes of non-hazardous waste to be despatched off-site for final treatment/ disposal over a 13-year decommissioning period. In the worst-case year (year 3) ~9,500 tonnes of non-hazardous waste will require off-site disposal.	Minor Negative	Not Significant	The quantities of non-hazardous waste to be despatched off-site in the worst-case year is significantly less than 50,000 tonnes per annum.
Conventional waste: Third party (off-site) hazardous waste facilities	~5,700 tonnes of hazardous waste to be despatched off-site for final treatment/ disposal over a 13-year decommissioning period. In the worst-case year (year 12) ~1,400 tonnes of hazardous waste will require off-site disposal.	Minor Negative	Not Significant	The quantities of hazardous waste to be despatched off-site in the worst-case year is significantly less than 20,000 tonnes per annum.

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Radioactive Waste and Discharges

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20 Radioactive Waste and Discharges

20.1 Introduction

20.1.1. This chapter presents the baseline context with specific reference to the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended)[1] (hereafter referred to as 'EIADR') consenting requirements, as they apply to the management of radioactive waste and radioactive discharges, applicable to the Proposed Works.

20.1.2. The chapter should be read in conjunction with the description provided in **Chapter 2: The Decommissioning Process** (see **Section 2.4**), **Chapter 12: Soils, Geology and Hydrogeology** and **Chapter 19: Conventional waste**. It should be noted that Chapter 12: Soils, geology and hydrogeology provides an assessment of the effects related to radioactively contaminated soils and groundwater as they apply to the Proposed Works.

20.2 Relevant legislation, policy and technical guidance

Legislation

20.2.1. The legislation in **Table 20-1** is relevant to the assessment of the effects with respect to radioactive waste and discharges.

Table 20-1 - Legislation relevant to radioactive waste and discharges

Legislation	Legislation issue
Environmental Permitting (England and Wales) Regulations 2016 (as amended)[2]	The Environmental Permitting (England and Wales) Regulations 2016 S.I. No. 1154 ("the 2016 Regulations") consolidate and replace the Environmental Permitting (England and Wales) Regulations 2010 S.I. No. 675. These Regulations require operators of facilities that could harm the environment or human health to obtain permits (which includes permits for the disposal or discharge of radioactive waste and discharges) for these facilities or to register others as exempt - the regime also provides for on-going supervision by regulators.
The Nuclear Installations Act 1965[3] (NIA)	This legal instrument controls the installation and operation of nuclear sites and imposes duties on holders of nuclear site licences and makes provision

1 UK Government (1999). The Nuclear Reactors (Environmental Impact Assessment for Decommissioning) (Amendment) Regulations 1999. (Online) Available at: Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (legislation.gov.uk)(Accessed August 2024).
2 UK Government (2016) The Environmental Permitting (England and Wales) Regulations 2016 (online). Available at: The Environmental Permitting (England and Wales) Regulations 2016 (legislation.gov.uk) (Accessed August 2024).
3 UK Government (1965). Nuclear Installations Act 1965 (Online). Available at: http://www.legislation.gov.uk/ukpga/1965/57 (Accessed August 2024).

Legislation	Legislation issue
	for compensation where injury or damage has been caused in breach of certain duties. It references the requirements for disposal and handling of nuclear waste.
The Ionising Radiations Regulations 2017, SI 2017 No 1075[4] (IRR)	Identifies the requirements for the use and control of ionising radiation in the United Kingdom. The regulations require that radiation exposure to workers and members of the public are restricted so far as is reasonably practicable.
Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018, SI 2018 No 482[5]	Address issues arising from the withdrawal of the UK from the EU and provide revisions to two existing sets of UK Regulations for Ionising Radiation that include devolved responsibilities, as follows: the Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018; and the Justification of Practices Involving Ionising Radiation Regulations 2004.

Policy

20.2.2. The UK has been producing and managing radioactive waste and discharges from a wide range of facilities and specific sources for many decades. Management of waste and discharges is subject to the policies presented in **Table 20-2**.

20.2.3. The principal objective of radioactive waste and discharges management is to use material resources efficiently and to minimise contamination (or activation) wherever practicable. Overarching waste management principles are presented in **Graphic 19.1** within **Chapter 19: Conventional Waste**. This waste hierarchy model seeks to minimise the quantity of waste that requires final disposal and to reduce the impact on receptors.

[4] UK Government (2017). The Ionising Radiations Regulations 2017 (Online). Available at: http://www.legislation.gov.uk/uksi/2017/1075/contents/made (Accessed August 2024).
[5] UK Government (2018). The Ionising Radiation (Basic Safety Standards) (Miscellaneous Provisions) Regulations 2018 (Online). Available at: http://www.legislation.gov.uk/uksi/2018/482/contents/made (Accessed August 2024).

Table 20-2 - Policy relevant to radioactive waste and discharges

Policy Reference	Policy Relevance
National policies	
National Planning Policy Framework (NPPF) (2023)[6]	The NPPF sets out the Government's planning policies for England, and "*provides a framework within which locally-prepared plans can provide for sufficient housing and other development in a sustainable manner".* Whilst the NPPF does not contain specific policies for applications relating to nuclear decommissioning, which are determined by the ONR rather than the local planning authority, it sets out an approach for achieving sustainable development. With respect to waste, NPPF states that "*minimising waste and pollution*" is a key factor in achieving the overarching environmental objective of the sustainable development policy.
Policy for the long-term management of solid low-level radioactive wastes[7]	This policy was published by the UK Government and Devolved Administrations and required the Nuclear Decommissioning Authority (NDA) to develop a UK wide strategy. The policy statement covers all aspects of the generation, management and regulation of solid Low-Level Waste (LLW), including the role of the NDA. It is acknowledged that each LLW management need will have its own approach and the development of solutions on a case-by-case basis is a matter for waste managers, therefore this policy is not prescriptive in its approach. The key aim of this policy statement is to provide a high-level framework within which individual LLW management decisions can be taken to ensure safe, environmentally acceptable and cost-effective management solutions that appropriately reflect the nature of the LLW concerned.
UK strategy for the Management of Solid Low-level Waste from the nuclear industry[8]	This document sets out the UK strategy for the management of solid low-level radioactive wastes arising from the nuclear industry. While the scope and direction of the original strategy remain unchanged, this document reflects the progress that has been made since 2010. It also reflects the expected direction for LLW management in the future. Central to the strategy is the implementation of the waste hierarchy (see Graphic 18.1), which supports the provision of continued capability and capacity for managing LLW in the UK.

[6] UK Government (2023). National Planning Policy Framework. (Online). Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf. (Accessed August 2024)
[7] Department for Environment, Food and Rural Affairs, DIT and the Devolved Administrations (2007). Policy for the Long Term Management of Solid Level Radioactive Waste in the United Kingdom (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/254393/Low_level_waste_policy.pdf (Accessed August 2024)
[8] Department of Energy and Climate Change (2016). UK Strategy for the Management of Solid Low Level Waste from the Nuclear Industry (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/497114/NI_LLW_Strategy_Final.pdf (Accessed August 2024).

Policy Reference	Policy Relevance
NDA Integrated Waste Management: Radioactive Waste Strategy[9]	This strategy applies to all radioactive waste generated within the NDA estate (including materials that may become waste at some point in the future). It provides a high-level framework for flexible decision-making, to ensure safe, environmentally acceptable and cost-effective solutions that reflect the nature of the radioactive waste concerned. A single radioactive waste strategy replaces the previous NDA strategy for Higher Activity Waste (HAW) and is consistent with the UK strategy for solid LLW.
Geological Disposal Facility (GDF) for higher-activity radioactive waste[10]	Increasing volumes of HAW will be produced as existing nuclear power stations reach the end of their lifetime and are decommissioned and cleaned up. The types and amounts of waste that make up this inventory for disposal are important because the layout and design of any disposal facility will need to be tailored to them, and also because communities considering hosting a GDF will want to be clear about what wastes are destined for it. Reprocessing of spent fuel from Advance Gas-cooled Reactors (AGRs) was completed in November 2018. The remaining and future HAW arising from AGRs will predominantly be stored pending decisions about its future disposal. Some Interim Level Waste (ILW) will be consigned off site for treatment and disposal.
UK Strategy for Radioactive Discharges (2009)[11]	The UKSRDS09 sets out the UK Government policy on radioactive discharges: that the unnecessary introduction of radioactivity into the environment is undesirable, even at levels where doses to humans and other species are low and, on the basis of current knowledge, are unlikely to cause harm. The UKSRDS09 is based on the use of Best Available Techniques to prevent, and where this is not practicable, minimise waste generation and discharges to the environment. The Strategy describes how the UK will implement the agreements made at the 1998 OSPAR Ministerial meeting (and subsequent meetings and reviews).
Local policy	
Somerset Waste Core Strategy (2013)[12]	Policy DM9 – radioactive waste treatment and storage. This policy states that planning permission for the treatment and/or interim storage of radioactive waste at Hinkley Point will be granted within the licensed area subject to the applicant demonstrating that the proposed development: • is consistent with national strategy for radioactive waste management;

[9] Nuclear Decommissioning Authority (2019) Integrated Waste Management Radioactive Waste Strategy (Online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/831727/Radioactive_Waste_Management_Strategy_September_2019.pdf (Accessed August 2024).

[10] Department for Business, Energy and Industrial Strategy (2019) Geological Disposal Facility (GDF) for higher-activity radioactive waste (Online). Available at: https://www.gov.uk/government/collections/geological-disposal-facility-gdf-for-high-activity-radioactive-waste (Accessed August 2024)

[11] Department of Energy and Climate Change (2009) UK Strategy for Radioactive Discharges [online]. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/249884/uk_strategy_for_radioactive_discharges.pdf (Accessed August 2024).

[12] Somerset County Council (2013) Waste Core Strategy Development Plan Document up to 2028 [online]. Available at: https://www.somerset.gov.uk/waste-planning-and-land/somerset-waste-core-strategy/ (Accessed August 2024)

Policy Reference	Policy Relevance
	• includes adequate measures to mitigate adverse impacts on the environment and local community or, as a last resort, proportionately compensate for or offset such impacts; and • is supported by robust economic and environmental assessments.

Technical guidance

20.2.4. A summary of the relevant technical guidance informing this chapter is given in **Table 20-3**.

Table 20-3 - Technical Guidance relevant to radioactive discharges and waste

Technical Guidance	Context
Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation 2018[13]	This is a guidance document for the regulation of decommissioning sites. This guidance specifically requires operators to: • produce a waste management plan; • produce a site wide environmental safety case; and • make sure the condition of their sites meets standards for protection of people and the environment, now and into the future. This guidance document identifies: "*i) the requirement for optimised plans for the management of the radioactive wastes from decommissioning and clean-up of a nuclear site* *ii) the standards that must be met if those optimised plans identify that radioactive wastes are best managed by on-site disposal;* and *iii) the standards that a nuclear site must meet to enable it to be released from RSR*"
Decommissioning Nuclear Safety Technical Assessment Guide, NS-TAST-GD-026 Revision 5[14]	This technical assessment guide advises and informs the regulatory judgements of the Office for Nuclear Regulation inspectors in relation to decommissioning at nuclear licensed sites. This guidance contains principles that relate to the management of radioactive waste at all stages of the lifecycle of a facility. This guidance is applicable to all nuclear sites throughout the UK.

[13] UK Government (2018). Decommissioning of nuclear sites and release from regulation. (Online). Available at: https://www.gov.uk/government/publications/decommissioning-of-nuclear-sites-and-release-from-regulation/decommissioning-of-nuclear-sites-and-release-from-regulation (Accessed August 2024)
[14] Office for Nuclear Regulation (2019) Decommissioning Nuclear Safety Technical Assessment Guide, NS-TAST-GD-026 Revision 5 (Online) Available at: ns-tast-gd-026.docx (live.com) (Accessed August 2024).

Technical Guidance	Context
Management of Radioactive Material and Radioactive Wastes on Nuclear Licensed Sites, Nuclear Safety Technical Assessment Guide, NS-TAST-GD-24 Issue 7.1[15]	This technical assessment guide advises and informs the regulatory judgements of the Office for Nuclear Regulation inspectors in relation to the management of nuclear matter on nuclear licensed sites. This guidance contains principles that relate to the management of radioactive waste at all stages of the lifecycle of a facility. This guidance is applicable to all nuclear sites throughout the UK.
Joint Regulatory Guidance on Management of Higher Activity Waste on Nuclear Licensed Sites[16]	This document provides guidance covering the management of HAW on nuclear licensed sites. The document describes the regulatory process and expectations in the regulatory process, integrated waste strategies (IWS), radioactive waste management cases (RWMCs), waste minimisation, characterisation and segregation, waste conditioning and disposability, storage, and managing information and records relating to radioactive waste.

20.3 Data gathering methodology

Desk study

20.3.1. This chapter of this Environmental Statement has been undertaken with reference to **Chapter 2: The Decommissioning Process,** supported by a number of data sources including:

- Radioactivity In Food and the Environment (RIFE) Reports;
- The UK Radioactive Waste Inventory (UKRWI); and
- The Hinkley Point B (HPB) Environmental Permit (EPR/CB3735DT).

Survey work

20.3.2. No specific survey work has been undertaken to inform the development of this chapter of the Environmental Statement with the conclusions based upon published data sources only.

Data limitations

20.3.3. The project description provides information regarding current quantities of radioactive waste identified as part of HPB's submission to the UK Radioactive Waste Inventory in 2022 (hereafter 'UK RWI 22'). These quantities are provided as a conservative estimate of waste volumes prior to future

[15] Office for Nuclear Regulation (2019) Management of Radioactive Material and Radioactive Wastes on Nuclear Licensed Sites Nuclear Safety Technical Assessment Guide, NS-TAST-GD-24 Issue 7.1 (Online) Available at: ns-tast-gd-024.docx (live.com) (Accessed August 2024)

[16] Office for Nuclear Regulation, Natural Resources Wales, Scottish Environment Agency, Environment Agency (2021) The Management of Higher Activity Waste on Nuclear Licensed Sites. Joint guidance (Online) Available at: The management of higher activity radioactive waste on nuclear licensed sites (onr.org.uk) (Accessed August 2024).

work required to characterise these wastes. Best Available Techniques (BAT) studies to understand the most appropriate radioactive waste management solution are also in most cases not yet complete, and thus UK RWI 22 volumes are understood to be bounding. As decommissioning proposals further develop, it is anticipated that these studies may identify changes in the quantities of Interim Level Waste (ILW) and Low Level Waste (LLW) and changes in how these wastes will be processed, packaged, transferred and disposed of.

20.4 Consultation

Overview

20.4.1. Given that the management of radiological waste and discharges for nuclear licensed sites and facilities is subject to current and ongoing governance and oversight by the licensee, no specific consultation has been undertaken to inform this ES chapter.

Pre-application Opinion

20.4.2. A Pre-application opinion was adopted by the Office for Nuclear Regulation (ONR), on 07 December 2022. A summary of the elements of the Pre-application Opinion that are of relevance to the assessment of effects on radioactive waste and discharges and confirmation of how these are addressed by the assessment is included in **Table 20-4.**

Table 20-4 - Summary of Pre-application Opinion Responses

Reference	Consideration	How addressed in the ES
Page 37	Chapter 19 (Radioactive Waste and Discharges) of the Scoping Report states that the impact of ILW on interim storage facilities has been scoped out of the assessment (19.6.9). Given that there are uncertainties associated with the strategic assumption that HPB ILW can be stored in the HPA Interim Storage Facility, this impact may have been scoped out prematurely.	Since the Scoping Report was submitted in 2022, as per paragraph 20.6.6. of this chapter, the Applicant and NRS have come to an agreement that ILW requiring long-term storage generated in the Preparations for Quiescence phase at HPB can be stored in the ILW Store at the HPA site, utilising existing capacity.

Non-statutory consultation

20.4.3. The first non-statutory consultation on the Proposed Works took place from 10 October to 21 November 2022, and the second took place from 15 April to 27 May 2024.

20.4.4. A second round of public stakeholder consultation was undertaken from 15 April to 27 May 2024 to present the updated Decommissioning Strategy and updated environmental information following receipt of the pre-application opinion from the Office for Nuclear Regulation (ONR) and any additional information identified between Round 1 and Round 2 Consultation.

20.4.5. Responses to both the first and second rounds of non-statutory engagement are presented in the **Consultation Feedback Report**. Comments relevant to the radioactive waste and discharges assessment are summarised in **Table 20-5**.

Table 20-5 Comments received during non-statutory consultation relevant to the radioactive waste and discharges assessment

Respondent	Comment received	Response from the Applicant
Round 1 consultation		
Member of the public	Suggestion that monitoring for any radioactive dust emitted during deconstruction is important and that any approach which could minimise the risk of radioactive dust being emitted should be taken.	EDF undertakes environmental monitoring that provides a very good understanding of radiological background around the Site. The results of the monitoring are published by the Environment Agency in the Radioactivity in Food and the Environment (RIFE) annual report.
Member of the public	Request for information on the quantities of radioactive and conventional wastes that will be produced during decommissioning.	Information on the quantities of radioactive and conventional wastes that will be produced during decommissioning will be shared as part of the Environmental Statement under the EIADR.
Round 2 consultation		
Somerset Council	Request for pre-application engagement with Somerset Council Planning Service ahead of the submission of any planning application for infrastructure for the management of radioactive waste.	Thank you for your comment, this is noted. We will liaise with the council at the appropriate time, in advance of any further applications.
Somerset Council	Suggestion that guidance will need to be considered for on-site disposal of suitable "low level" and "very low-level radioactive waste" on nuclear and decommissioned sites.	On-site disposal of low-Level Waste does not currently form part of the decommissioning proposals at the Site. If the decommissioning strategy changes, we will seek relevant permissions where required.

Technical engagement

20.4.6. No technical engagement has been undertaken in relation to the radioactive waste and discharges assessment.

20.5 Overall baseline

Current baseline

20.5.1. At the time of writing (April 2024) defueling of the reactors at HPB has commenced, following the end of generation in August 2022. Defueling is due to be completed in 2025.

20.5.2. The defueling process will significantly reduce the radioactive inventory present within the Site and this process is not regulated under EIADR, and therefore does not form part of the Proposed Works. Activities carried out during defueling are restricted to normal business as usual operations associated with radioactive waste management during operation of the power station up until fuel free verification (FFV) is achieved.

20.5.3. The regulation and impact of solid, liquid and gaseous discharges of radioactive waste on the environment and human health is undertaken through a permitting regime, under the Environmental Permitting (England and Wales) Regulations 2016 (as amended). These discharges (or disposals) and their impacts are assessed in detail during the process for applying for a permit (or a variation) and are regulated by the Environment Agency through routine regulatory interactions. Discharges of radioactive waste are currently well within permitted limits.

20.5.4. The effects of working with ionising radiation are specifically regulated by the UK Office for Nuclear Regulation (ONR) under the Ionising Radiation Regulations 2017[4] and through safety cases developed in accordance with the Applicant's requirements made to comply with the conditions of the Nuclear Site Licence granted under the Nuclear Installations Act 1965[3]. Ionising radiation exposures to workers at HPB are currently well within the relevant dose limits.

20.5.5. The environmental regulators (including the Environment Agency) and food standards agencies publish annual reports under the Radioactivity in Food and the Environment (RIFE) programme which present the radiation doses to members of the public who live and work near nuclear sites in the UK. Radiation dose estimates are based upon sampling and analysis of foodstuffs and environmental media and surveys of the habits of members of the public which include those persons who may be most exposed to radiation.

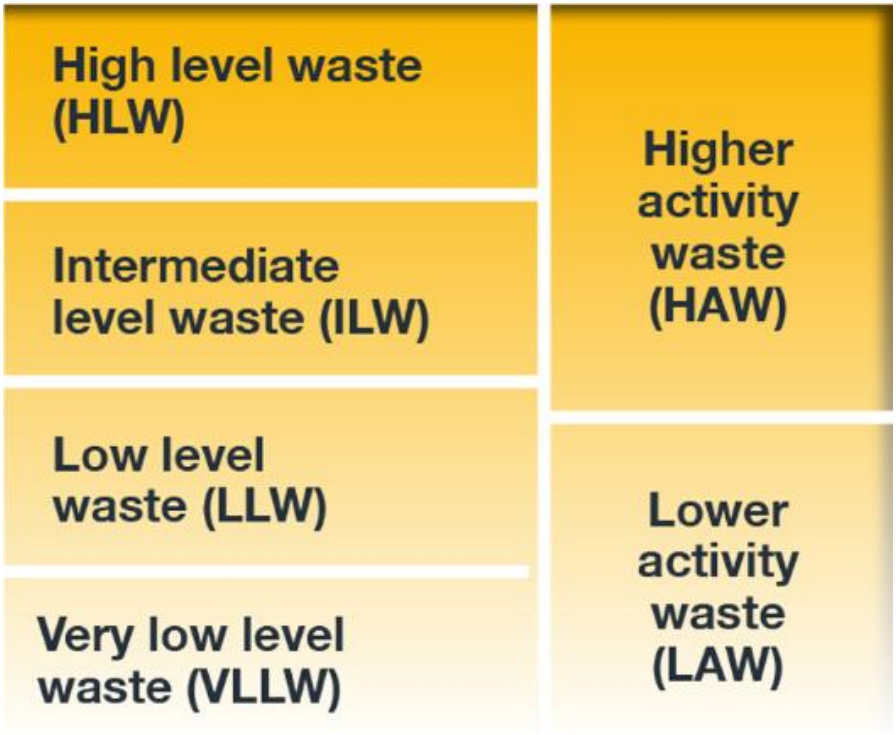
20.5.6. The RIFE report (RIFE 28)[17] indicates that for the Hinkley Point locality, 'Total dose' resulting from exposure to radioactivity in food and environment sources for the representative person (i.e. representative of people in the population most exposed to radiation) was 0.0015 millisieverts (mSv) per year. This is well below the legal limit of 1 mSv per year for exposure to artificial sources of radioactivity. For context, on average, public exposure to radiation amounts to about 2.3 mSv per year which is mostly due to natural sources.

[17] UK Government (2023). RIFE 28. (Online). Available at: https://www.gov.uk/government/publications/radioactivity-in-food-and-the-environment-rife-reports/rife-28-radioactivity-in-food-and-the-environment-2022. (Accessed August 2024)

Radioactive waste

20.5.7. A number of radioactive wastes are created on Advance Gas-cooled Reactors (AGR) nuclear power stations as part of normal operation. The types of waste arising include LLW[18] and ILW[19] which are defined in Paragraph 20.5.8 and Paragraph 20.5.9 respectively. No High Level Waste (HLW) is expected to be generated during the Proposed Works. **Graphic 20.1** highlights how VLLW, LLW, ILW and HLW are separated into a further categorisation of Lower Activity Waste (LAW) and Higher Activity Waste (HAW).

Graphic 20.1 Radioactive waste categorisation



[18] LLW is defined as waste containing radioactive materials not exceeding 4 gigabecquerels per tonne (GBq/te) of alpha radioactivity or 12 GBq/te of beta/gamma radioactivity. The term is usually taken to refer to solid wastes that are not exempt under the RSA93 but which are suitable for disposal or treatment at various off-site locations across the United Kingdom.

[19] ILW is defined as waste in which radioactivity levels exceed the upper boundaries for LLW, but which does not require its heat-generating properties to be taken into account in the design of storage or disposal facilities. In addition to the terms LLW and ILW, there are also some solid wastes that are potentially radioactive but which can be shown to contain radioactivity at levels below the relevant exemption level specified under the Environmental Permitting (England and Wales) Regulations 2016 (as amended), such that they become out of scope of the Regulations and therefore are suitable for disposal as non-radioactive waste. In respect of their radioactive content these wastes are often described as being 'below regulatory concern'. Such wastes can be and are (as soon as possible after they arise) re-used, recycled or disposed of by whatever routes are appropriate, taking account of their non-radioactive characteristics and the Waste Hierarchy.

20.5.8. LLW is defined as waste containing radioactive materials not exceeding 4 gigabecquerels per tonne (GBq/te) of alpha radioactivity or 12 GBq/te of beta/gamma radioactivity. The term is usually taken to refer to solid wastes that are not exempt under the RSA'93 but which are suitable for disposal at various off-site locations across the United Kingdom.

20.5.9. ILW is defined as waste in which radioactivity levels exceed the upper boundaries for LLW, but which does not have heat generating properties and therefore does not require this issue to be taken into account in the design of storage or disposal facilities.

20.5.10. Solid and non-aqueous liquid radioactive waste generated at HPB during operation included compactible and combustible waste (e.g. PPE, cleaning wipes etc) which are typically sent for incineration or disposal to an appropriate facility to be managed; activated and contaminated metals which can either be recycled via a metals recovery facility or disposal to an appropriate landfill; and, desiccant and catalysts and wet sludges (including potable water treatment plant (PWPT) sludge). Whilst decommissioning wastes may be similar to those that have arisen during operation, they may have a different radionuclide fingerprint. The selection of the optimal disposal routes and whether on-site or off-site treatment techniques are utilised is subject to the application of Best Available Techniques (BAT) and the waste hierarchy (see **Figure 19.1** in **Chapter 19: Conventional Waste**). The two overarching waste management principles (i.e. the waste hierarchy and the proximity principle) also affect the management, storage and disposal of waste.

20.5.11. There is currently no central disposal facility available for ILW in England. The Integrated Waste Management - Radioactive Waste Strategy 2019[20] therefore recommends storage of ILW until a suitable site has been identified and constructed by government for a GDF. Following an optioneering study considering a new build ILW Store and use of NRS' existing ILW Store at HPA, it was concluded that ILW requiring long-term storage processed and packaged during the Proposed Works would be stored in the HPA ILW Store until a GDF is available. This strategic assumption is subject to further waste characterisation and studies of the most suitable waste packaging solution for each waste stream.

Future baseline

20.5.12. It is expected that the radiological discharges during the Proposed Works will be lower than the currently authorised operational discharges from the Site. Discharges of treated radioactive effluent will be made through the Active Effluent Discharge Line (AEDL) and will operate within the limitations of the environmental permit, granted under the Environmental Permitting (England and Wales) Regulations 2016 (as amended)[2]. As a result, it is reasonable to expect that the radiation exposure to members of the public will remain well below the statutory dose constraints.

20.5.13. In the absence of the Proposed Works, there are unlikely to be any notable changes to the existing radioactive waste infrastructure capacity.

[20] UK Government (2020). Radioactive Waste Strategy September 2019. Available at: https://www.gov.uk/government/consultations/nda-radioactive-waste-management-strategy/outcome/radioactive-waste-strategy-september-2019#executive-summary. (Accessed August 2024).

20.6 Justification for scoping out radioactive waste and discharges

20.6.1. A Scoping Report was submitted by EDF to the ONR on 05 October 2022. The Scoping Report outlined that radioactive wastes and discharges should be scoped out of the EIA for the Proposed Works due to the extensive regulations and processes already in place to manage their environmental effects and thus ensuring no significant effects on the environment. These are discussed in Paragraphs 20.6.2 to 20.6.9.

20.6.2. The HPB Environmental Permit (EPR/CB3735DT) issued under the Environmental Permitting (England and Wales) Regulations 2016 (as amended)[2], sets out limits and conditions relating to the disposal of solid and non-aqueous liquid radioactive wastes including those relating to wastes arising during decommissioning. To satisfy the conditions related to the obligations applicable to the licensee, waste will be managed utilising BAT in order to minimise the volume and activity of waste discharges to the environment. The permitting regime ensures that effects from radioactive discharges and disposals to the environment are tolerable and acceptable. As the permitting regime covers assessment of radioactive discharges and disposals to prevent significant effects, such discharges and disposals have been scoped out of this assessment.

20.6.3. Data on total volumes of waste and materials arising at HPB are provided to the UK Government sponsored Radioactive Waste & Materials Inventory (UKRWI), on a three yearly basis. The UKRWI helps the UK plan safe and efficient management routes and is used to support the planning, operation and performance of supply chain waste management facilities. By providing data to the UKRWI, HPB helps ensure that there is sufficient availability in the UK supply chain for its wastes. HPB will continue to forecast waste arisings from decommissioning and will provide data on its forecasted waste streams throughout the duration of the Proposed Works, thus ensuring its wastes are considered in the planning and operation of the UK's radioactive waste facilities.

20.6.4. Estimated quantities of radioactive waste which are anticipated to be generated during the Proposed Works are presented in **Section 2.4** of **Chapter 2: The Decommissioning Process**.

20.6.5. ILW is subject to an assessment process which helps minimise its impact on the capacity and function of the future GDF for ILW. The process results in a Letter of Compliance (LoC) for each ILW stream at each site which confirms its acceptability at the future GDF for disposal and allows NWS to plan for sufficient capacity and timely availability for disposal. The impact from ILW on the future capacity of the GDF can therefore be scoped out of this assessment.

20.6.6. Some ILW arising during the Preparations for Quiescence phase and Final Site Clearance, may require long-term storage, prior to disposal at the GDF. NDA, the Applicant and NRS have come to an agreement that ILW requiring long-term storage generated in the Preparations for Quiescence phase at HPB can be stored in the ILW Store at the HPA site utilising existing capacity. Further development work is being undertaken to support the necessary regulatory approvals, to update safety cases and obtaining LoCs, therefore the impact of ILW on interim storage facilities can be scoped out of this assessment.

20.6.7. All radioactive waste will be managed safely and prepared for disposal at suitable on-site facilities. If any facility requires planning consent under the Town and Country Planning Act, the direct and indirect impacts of these facilities would be assessed at that time. The impact as a result of managing LLW on-site in this manner can therefore be scoped out.

20.6.8. The final disposal solution for some LAW may be to dispose of the waste on the HPB site. The Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation 2018[13] produced jointly by the Environment Agency, Natural Resources Wales (NRW) and the Scottish Environmental Protection Agency (SEPA) sets out the standards that must be met in this regard. If this approach is applied at the site, the disposal of LAW in this manner can also be scoped out of this assessment. In addition to meeting the requirements of this guidance, the Applicant will need to meet the relevant guidance in respect of the future surrender of the environmental permit.

20.6.9. In addition to the regulatory expectations and requirements discussed above, an Integrated Waste Strategy (IWS) will be prepared. This will set out how waste (non-radioactive and radioactive solid waste as well as gaseous and liquid discharges) will be managed in accordance with regulatory expectations. A Radioactive Waste Management Case (RWMC) will be used to demonstrate the longer-term safety and environmental performance of the planned management of specific waste(s) or discharges and provide a transparent demonstration of optimised radioactive waste management, compliance with regulatory expectations, policy, national and international standards. Furthermore, it will demonstrate how waste management operations are integrated across the lifetime plans for the waste and / or site as a whole.

20.6.10. Using an IWS and the RWMCs, waste and discharge management activities can be shown to be optimised as to minimise its negative impacts and how the requirements of UK policy are met. These will be made available for regulatory scrutiny at an appropriate point of maturity and together with the regulatory regimes discussed above, it is considered that there is sufficient scrutiny and oversight of radioactive waste and discharge management such that it can be scoped of this assessment.

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Cumulative Effects Assessment

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21 Cumulative Effects Assessment

21.1 Introduction

21.1.1. There is the potential for effects associated with the Proposed Works to interact with, or combine with, the effects arising from other developments or projects proposed in the geographical area which may be subject to effects as a result of the Proposed Works, and which have the same temporal duration such that cumulative effects could occur. This therefore may result in a greater significance of effect relative to the delivery of the Proposed Works in isolation. These potential effects are referred to as cumulative effects.

21.1.2. This chapter of the Environmental Statement (ES) presents the cumulative effects assessment (CEA) for the Proposed Works. Two types of cumulative effects have been considered within the CEA:

- Intra-project effects: effects that occur as a result of two or more environmental aspect effects acting together (i.e. combined), to result in new or changed effects on a single receptor; and
- Inter-project effects: effects that arise as a result of the Proposed Works in combination with other large-scale developments or projects (termed 'other developments').

21.2 Relevant legislation, policy and technical guidance

21.2.1. **Chapter 4: Policy and Legislation Overview** of the ES identifies and describes legislation, planning policy and guidance of relevance to the assessment of likely significant effects associated with the Proposed Works. Each of the environmental aspect chapters of this ES (**Chapters 6 - 20**) also provide detail on the legislation, planning policy and guidance relevant to the assessment of the environmental aspect being considered.

21.2.2. This section provides an overview of the specific legislation, policy and guidance which is of relevance to the assessment of cumulative effects.

Legislation

21.2.3. Legislation relevant to the assessment of cumulative effects is provided in **Table 21-1**.

Table 21-1 - Legislative context for the CEA

Legislation	Legislation Issue
Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (EIADR) (as amended)[1]	Schedule 1 (para 5) of the Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1991 (EIADR) (as amended) states that ES should present "*A description of the likely effects of the proposed project on the environment which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project*"

[1] UK Government (1999). Nuclear Reactors (Environmental Impact Assessment for Decommissioning) Regulations 1999 (as amended) (Online) Available at: https://www.legislation.gov.uk/uksi/1999/2892/contents/made (Accessed August 2024).

Policy

21.2.4. Policy relevant to the assessment of cumulative effects is provided in **Table 21-2**.

Table 21-2 - Policy context for the CEA

Policy	Context
National Planning Policy Framework (NPPF) (2023)[2]	The NPPF was published in March 2012 and has undergone a series of revisions, most recently in December 2023. It sets out the Government's planning policies for England and is a material consideration in determining planning applications. The NPPF includes references to cumulative in reference to transport, landscape, historic environment, flood risk and ground conditions.
Adopted West Somerset Local Plan to 2032 (2016)[3]	The West Somerset Local Plan was adopted in November 2016. Policy CC4 Coastal Zone Protection states: Development within the coastal zone and outside of settlements where the plan's policies provide for development will only be permitted for uses and activities for which a coastal location is essential, and they cannot be located elsewhere. Account will be taken of; ▪ impact on the coastal environment, ▪ scale of the development, ▪ cumulative impact on surrounding land and property, and, ▪ measures taken to minimise and mitigate these matters.
Sedgemoor Local Plan 2011-2032 (2019)[4]	The 2011-2032 Local Plan replaces the Core Strategy 2006-2027 and sets out how the district aims to grow and develop into the future. Policy MIP1 in relation to major infrastructure states '*The Council will consider the benefits and impacts of a proposal having regard to direct, indirect secondary and cumulative benefits and impacts, and benefits and impact interactions. This assessment will include the construction, operation and decommissioning (including restoration) stages of the project.'*

[2] Ministry of Housing, Communities and Local Government. (2021). The National Planning Policy Framework (NPPF). (Online) Available at: https://assets.publishing.service.gov.uk/media/65a11af7e8f5ec000f1f8c46/NPPF_December_2023.pdf https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf (Accessed August 2024).

[3] West Somerset Council (2016). West Somerset Local Plan to 2032. (Online) Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSWT - West Somerset Local Plan%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (Accessed August 2024).

[4] Sedgemoor District Council. (2019). Local Plan 2011-2032 Sedgemoor Local Plan – Adoption Version. (Online) Available at: somersetcc.sharepoint.com/sites/SCCPublic/Planning and Land/Forms/AllItems.aspx?id=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy%2FSedgemoor Local Plan 2011-2032 Adoption Version%2Epdf&parent=%2Fsites%2FSCCPublic%2FPlanning and Land%2FPlanning Policy&p=true&ga=1 (Accessed August 2024).

Technical guidance

Intra-project effects

21.2.5. There is no specific agreed EIA methodology for assessing and quantifying effects on sensitive receptors or resources resulting from the interaction of different impacts from the same project. The intra-project effects assessment has therefore been based on professional judgement and previous experience of similar projects.

Inter-project effects

21.2.6. A summary of the technical guidance for the assessment of inter-project effects is given in **Table 21-3**.

Table 21-3 - Technical guidance relevant to inter-project effects

Technical Guidance	Context
Planning Inspectorate in Advice Note Seventeen[5]	Advice Note 17 presents a four-stage approach to the assessment of inter-project effects. It is acknowledged that Advice Note 17 applies to Development Consent Order applications in England and Wales. However, Advice Note 17 provides a structured approach to the assessment of cumulative effects. Therefore, the assessment of inter-project effects has been undertaken in line with this guidance.

21.3 Intra-project effects assessment

Study Area and methodology of the intra-project effects

Study Area

21.3.1. The Study Area for the intra-project CEA has used the Study Areas set out within each the environmental aspect chapter, which are relevant to specific receptors or resources and define the maximum area within which potential effects of the Proposed Works could occur.

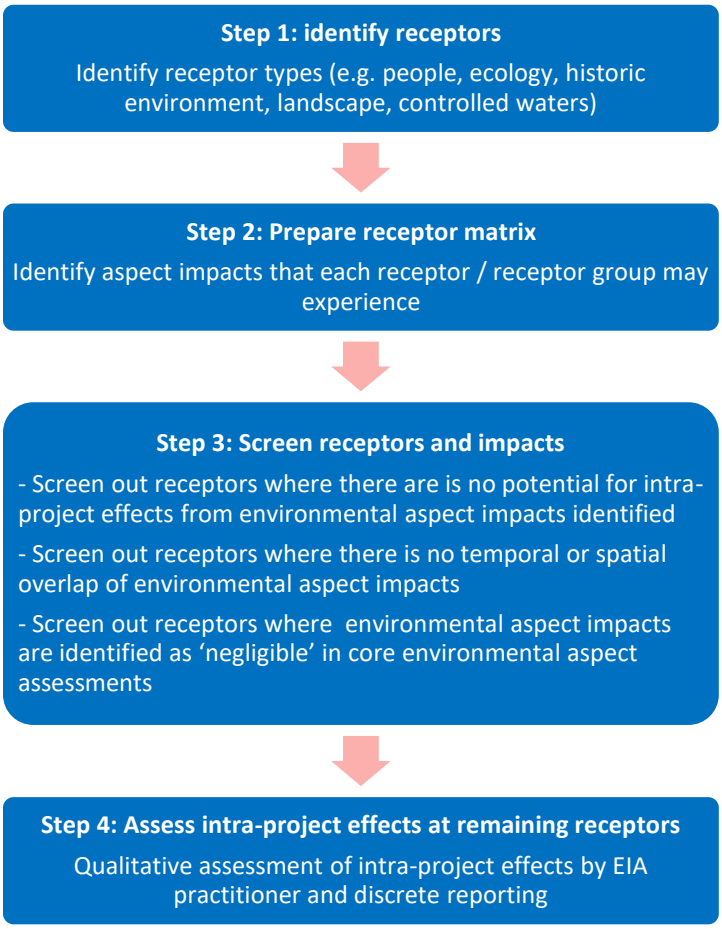
General Methodology for the assessment of intra-project effects

21.3.2. As there is no standard approach to the assessment of intra-project effects it has been undertaken with reference to previous experience and professional judgement.

21.3.3. As set out in **Chapter 5: Approach to Environmental Impact Assessment** of this ES, the proposed approach used for the assessment of intra-project effects for the Proposed Works is shown in **Graphic 21-1**. This follows a receptor-based approach for the consideration of intra-project effects.

[5] The Planning Inspectorate (2019). Advice note seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects. (Online) Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/ (Accessed August 2024).

Graphic 21-1 - Intra-project effects assessment process



Assessment of intra-project effects

Step 1

21.3.4. Step 1 requires the identification of the potential receptors which may experience intra-project effects. This step involves reviewing the identified environmental receptors, within **Chapters 6-20** of the ES, across all phases of the Proposed Works, to identify which are common across multiple environmental aspect assessments.

21.3.5. The common receptors include:

- Workers of Hinkley Point B (HPB) power station;
- Hinkley Point A (HPA) power station site (workers);
- Hinkley Point C (HPC) construction site (workers);
- Residents within rural communities in the vicinity of HPB (such as Stolford, Wick, Shurton, Stogursey), as well as residents within the local community of Bridgwater;
- Visitors to the area (including the users of public rights of way, promoted routes and roads);
- Statutory and Non-Statutory Biodiversity Conservation Sites – Terrestrial;
- Statutory and Non-Statutory Biodiversity Conservation Sites – Marine;

- Habitats – Terrestrial;
- Habitats – Marine;
- Protected Species – Terrestrial;
- Protected Species – Marine;
- Landscape Character;
- Above and below ground heritage assets;
- Coastal Protection;
- Surface water;
- Groundwater; and
- Soils.

Step 2

21.3.6. Step 2 of the intra-project CEA comprises a review of the residual effects on the common receptors (identified in Step 1) across **Chapters 6-20** of the ES.

21.3.7. **Table 21-4** and **Table 21-5** below summarises the effects different environmental aspects have identified on the same receptors or receptor groups, and the potential for likely significant effects during the Proposed Works. Where environmental aspect assessments have scoped out the Proposed Works (for example during the Quiescence phase) it is expected there would be no or negligible effects on a receptor and therefore such effects are not considered further within the CEA.

21.3.8. In all cases, the assessment of likely significant effects follows the application of environmental embedded and good practice measures as set out **Chapters 6-20** of the ES.

Table 21-4 - Common receptors and the significance of identified effects during Preparations for Quiescence and Final Site Clearance phases

Receptors	Air quality	Terrestrial biodiversity and ornithology	Marine biodiversity	Coastal Management and Water Quality	Surface Water and Flood Risk	Soils, Geology and Hydrogeology	Historic Environment	Landscape and Visual	Noise and vibration	People and Communities	Traffic and Transport
Workers of HPB power station	NS				NS	NS			NS	S	NS
HPA station site (workers)											
HPC site (workers)	NS				NS	NS		NS	NS		NS
Rural communities in the vicinity of HPB site (Stolford, Wick)	NS							S	NS	NS	NS
Rural communities in the vicinity of HPB site (other)	NS							NS	NS	NS	NS
Communities and residential receptors within Bridgwater	NS							NS	NS	NS	NS
Users of public rights of way, promoted routes and roads	NS							NS to S	NS	NS	NS
Statutory and Non-Statutory Biodiversity Conservation Sites – Terrestrial	NS	NS									
Statutory and Non-Statutory Biodiversity Conservation Sites – Marine			NS	NS	NS						

Receptors	Air quality	Terrestrial biodiversity and ornithology	Marine biodiversity	Coastal Management and Water Quality	Surface Water and Flood Risk	Soils, Geology and Hydrogeology	Historic Environment	Landscape and Visual	Noise and vibration	People and Communities	Traffic and Transport
Habitats – Terrestrial	NS	NS									
Habitats – Marine			NS	NS	NS						
Protected Species – Terrestrial	NS	NS							NS		
Protected Species – Marine			NS	NS	NS				NS		
Landscape Character		NS						NS			
Above and below ground heritage assets							NS	NS			
Coastal Protection				NS	NS						
Surface water				NS	NS	NS					
Ground Water				NS	NS	NS					
Soils					NS	NS					

S = Significant; NS = Not Significant

Table 21-5 - Common receptors and the significance of identified effects during Quiescence phase

Receptors	Historic Environment	Landscape and Visual	Coastal Management and Water Quality	Surface Water and Flood Risk	Soils, Geology and Hydrogeology
Landscape Character	NS	NS			
Above and below ground heritage assets	NS	NS			
Coastal Protection			NS	NS	
Surface water			NS	NS	NS
Ground Water			NS	NS	NS
Soils				NS	NS

S = Significant; NS = Not Significant

Step 3

21.3.9. Based on the methodology detailed in the previous section, each of the identified receptors and likely significant effects they may experience has been reviewed and screened for potential intra-project effects. This screening is provided in **Appendix 21A: Intra-project screening tables** and summarised in **Table 21-6**.

21.3.10. Where more than one effect on a particular receptor / resource has been identified, the potential for combined effects has been assessed, with consideration given to the nature of the impact and the potential to combine with other impacts on a receptor or resource. Where there is considered to be no potential for effect interactions that lead to a combined effect, or the environmental aspect assessment presented in **Chapters 6-20** have already considered the potential for intra-project effects within their respective assessments, this is stated. Where screened in, the potential effect interactions are further discussed in Step 4.

Table 21-6 - Summary of Stage 3 screening exercise

Receptors	Taken forward to Stage 4		
	Preparations for Quiescence	Quiescence	Final Site Clearance
Workers of HPB power station	N	N/A	N
HPA station site (workers)	N	N	N/A
HPC site (workers)	N	N/A	N
Rural communities in the vicinity of HPB site (Stolford, Wick)	Y	N/A	Y
Rural communities in the vicinity of HPB site (other)	N	N/A	N
Communities and residential receptors within Bridgwater	N	N/A	N
Users of public rights of way, promoted routes and roads	Y	N/A	Y
Statutory and Non-Statutory Biodiversity Conservation Sites – Terrestrial	N	N/A	N
Statutory and Non-Statutory Biodiversity Conservation Sites – Marine	N	N/A	N
Habitats – Terrestrial	N	N/A	N
Habitats – Marine	N	N/A	N
Protected Species – Terrestrial	N	N/A	N

Receptors	Taken forward to Stage 4		
	Preparations for Quiescence	Quiescence	Final Site Clearance
Protected Species – Marine	N	N/A	N
Landscape Character	N	N	N
Above and below ground heritage assets	N	N	N
Coastal Protection	N	N	N
Surface water	N	N	N
Groundwater	N	N	N
Soils	N	N	N

Step 4

21.3.11. The preceding steps identified that there is the potential for likely significant intra-project effects in relation to residents within the rural communities close to the HPB and visitors to the area (including the users of public rights of way, promoted routes such as the King Charles III path, and roads) during the Preparations for Quiescence and Final Site Clearance phases.

Rural communities in the vicinity of Hinkley Point B power station site

Preparations for Quiescence phase

21.3.12. Residents within rural communities in the vicinity of HPB including Stolford and Wick would experience:

- Minor adverse effects arising from dust emissions resulting from activities in the Works Area;
- Minor adverse effects from noise generated by activities undertaken during the Proposed Works and road traffic noise; and
- Up to minor adverse effects on visual amenity from properties, and residents may also use recreational facilities such as King Charles III England Coast Path and West Somerset Coast Path, Castles & Coast Way and local Public Rights of Way (PRoW) network, from which there may be up to major adverse effects on views.

21.3.13. In addition, there would be a reduction in the number of workers during the Preparations for Quiescence phase, resulting in moderate adverse effects on the HPB workforce, who are expected to live locally. This may lead to variable periods of unemployment. Effects on mental health are possible due to the known links with worklessness but will vary by the individual and their circumstances.

21.3.14. Considered cumulatively, impacts resulting in these effects are likely to lead to an increased sense of disturbance and discontent within local rural communities, during the Preparations for Quiescence phase. Noise, dust emissions and visual amenity effects arising from the Proposed Works would be transient in nature due to the phased approach to deconstruction, dismantling and decommissioning. With the adoption of good practice environmental management and the incorporation of proposed embedded measures, noise, dust emissions and visual amenity effects communities have been minimised as far as is reasonably practicable.

21.3.15. The loss of employment from HPB would be permanent during worker lifetimes. The overall effect on workers at HPB recognises that the typical employee is likely to have skills and experience of high relevance to future opportunities at HPC and local markets. In addition, the falling trends in unemployment and the relatively accessible employment markets indicate wider opportunities

21.3.16. The Applicant, as part of its resource planning for decommissioning will undertake career aspirational discussions with staff; offer contractual redundancy schedules; assist workers with necessary retraining to facilitate suitability for decommissioning at HPB roles or alternative roles within the Applicant organisation; specific collaboration with HPC on deployment opportunities; work with third-parties to advertise new opportunities for staff; and continue to support staff with post-employment references for alternative posts. .

Quiescence phase

21.3.17. No likely significant intra-effects associated with the Quiescence Phase was identified in Step 3 and not considered further.

Final Site Clearance phase

21.3.18. During the Final Site Clearance phase, there is the potential for significant intra-effects associated on residents within rural communities in the vicinity of HPB as receptor groups would experience similar noise, emissions to air and landscape and visual amenity effects observed (but no worse than) the Preparations for Quiescence phase. Considered cumulatively, the impacts resulting in these effects are likely to lead to an increased sense of disturbance and discontent within local communities. However, any effects would be transient in nature and would result in the culmination of the decommissioning works, releasing the Site for future use. With the adoption of good practice environmental management and the incorporation of embedded measures (which will include the use of future technologies) effects on rural communities would be minimised as far as is reasonably practicable. It is considered that these communities are not likely to experience significant intra-project effects.

Visitors to the area (including users of public rights of way, promoted routes and roads)

Preparations for Quiescence phase

21.3.19. Access along the King Charles III England Coast Path near the Site will be maintained throughout all phases of the Proposed Works (first on the diversion due to HPC activity, and then on its reinstated route after HPC construction is complete). Due to local conditions (potential noise/dust effects) already experienced as a result of the ongoing decommissioning of HPA and the construction of HPC, users of the coastal path and other nearby rights or way and roads, are unlikely to be further inconvenienced. Similarly, with the adoption of good practice environmental management and the incorporation of proposed embedded measures, noise, dust emissions and visual amenity effects on users arising from the Proposed Works would be minimised as far as is reasonably practicable. Overall, it is considered that the Proposed Works are not likely to have a significant intra-project effect on users.

Quiescence phase

21.3.20. No likely significant intra-effects associated with the Quiescence phase was identified in Step 3 and not considered further.

Final Site Clearance phase

21.3.21. Users of King Charles III England Coast Path would experience similar noise, dust, and landscape and visual amenity effects observed (but no worse than) in the Preparations for Quiescence phase. With the adoption of good practice environmental management and the incorporation of proposed embedded measures, noise, dust emissions and visual amenity effects on users arising from the Proposed Works would be minimised as far as is reasonably practicable. Overall, it is considered that the Proposed Works are not likely to have a significant intra-project effect on users.

21.4 Inter-project effects assessment

Study Area and methodology of the inter-project effects assessment

Study Area

21.4.1. The cumulative effects assessment has considered effects that are predicted to arise as a result of the Proposed Works, in combination with other projects, plans and/or programmes, that have the potential to result in a larger, or different, effect on a given receptor.

21.4.2. A Scoping Report for the Proposed Works was issued to the Office for Nuclear Regulation (ONR) on 5 October 2022. An initial long-list of other developments was prepared during Scoping which was updated in May 2024 to reflect any additional other developments that have been considered since Scoping and is presented in **Appendix 21B: Inter-project cumulative effects**. This includes the addition of the Bridgwater Tidal Barrier and Gravity Local Development Order, which whilst lying outside of the 5 km Zone of Influence (ZoI) related to the Proposed Works have been included at the request of the ONR.

21.4.3. Developments have been included on the basis that they are either:

- under construction / decommissioning;
- permitted application(s), but not yet implemented (those from the past 5 years have been considered, taking into account those that received planning consent over 3 years ago and are still valid, but have not been completed);
- submitted application(s) not yet determined;
- refused, subject to appeal procedures not yet determined;
- developments where EIA Screening and/or Scoping has been undertaken but a full planning application has not yet been submitted;

- on the National Infrastructure Planning Programme of Projects;
- identified local development orders[6] within the ZoI;
- identified in the local plan/development plan;
- West Somerset Local Plan to 2032 (2016); and
- Sedgemoor Local Plan 2011 – 2032.

21.4.4. There are a number of development types, which, due to their nature and scale, have not been considered to have the potential to result in cumulative impacts and were therefore screened out of the assessment. This has been based on professional judgement, undertaking a review of the distances from each element of the proposed development and the type of development and therefore the impacts likely to arise. This includes:

- construction of agricultural buildings (e.g. storage of livestock, machinery or feed);
- house extensions or cosmetic changes to buildings;
- roof mounted solar PV panels (or ground mounted less than 50kW output);
- work to trees;
- variations to planning permissions, or reserved matters applications; and
- small scale residential uses (less than 15 dwellings), or changes of buildings' use (unless it could itself in a cumulative effect, such as a conversion of several barns into a holiday village).

General methodology for the assessment of inter-project effects

21.4.5. While there is no standard approach to the CEA, this assessment follows the guidance set-out by the Planning Inspectorate (PINS) in Advice Note Seven: EIA: process, preliminary environmental information and environmental statements (PINS Advice Note 7)[7] and Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (PINS Advice Note 17)[8]. Advice Note 17 provides useful guidance, setting out a four-stage process for the identification and assessment of other developments. It is acknowledged that Advice Note 17 applies to Development Consent Order applications in England and Wales. However, Advice Note 17 provides a structured approach to the assessment of cumulative effects and therefore aspects of this approach have been applied to the Proposed Works.

21.4.6. The approach to the CEA generally follows PINS Advice Note 17 which includes four stages:

- Stage 1: Establishing the long list of 'other existing development and/or approved development'.

[6] Local Development Orders (LDOs) help set the planning framework for an area and bring forward development. LDOs provide permitted development rights for specified types of development in defined locations. They are flexible and locally determined tools that LPAs can use to help accelerate the delivery of appropriate development in the right places and removes the requirement for an application for planning permission albeit, in some cases, confirmation is required from the local planning authority (LPA) that the terms of the LDO have been complied with.

[7] PINS Advice Note Seven: EIA: process, preliminary environmental information and environmental statements Nationally Significant Infrastructure Projects - Advice Note Seven: Environmental Impact Assessment: process, preliminary environmental information and environmental statements - GOV.UK (www.gov.uk)

[8] PINS Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects Nationally Significant Infrastructure Projects - Advice Note Seventeen: cumulative effects assessment relevant to nationally significant infrastructure projects - GOV.UK (www.gov.uk)

- Stage 2: Establishing a shortlist of 'other existing development and/or approved development'.
- Stage 3: Information gathering.
- Stage 4: assessment.

21.4.7. Further detail on each of these stages, and how these have been applied to this CEA are described in detail below.

Stage 1: Establishing the long list of 'other existing development and/or approved development

21.4.8. The first step of Stage 1 is to identify a Zone of Influence (ZoI) within which an initial long list of projects can be identified. The ZoI has been based on a 5 km Study Area which was considered to be proportional on the basis of the Study Area's identified in the environmental aspect chapters.

21.4.9. PINS Advice Note 17 acknowledges that certain assessments, such as transport and associated operational assessments of vehicular emissions (including air and noise) may inherently be cumulative assessments. This is because they may incorporate modelled traffic data growth for future traffic flows. Where these assessments are comprehensive and include a worst-case within the defined assessment parameters, no additional cumulative assessment of these aspects is required.

21.4.10. The initial long list, provided in **Appendix 21B: Inter-project cumulative effects**, has been determined under the three tiers based on the PINS Advice Note 17 as set out in **Table 21-7**.

Table 21-7 - 'Other Development' for inclusion in the inter-project cumulative effects assessment

Hierarchy of other developments	Proposed criteria of other developments	
Tier 1	Under construction or currently undergoing decommissioning such as HPA	Decreasing level of detail likely to be available.
	Permitted application(s), where the project is classified as 'major development', whether under the Town and Country Planning (Scotland) Act 1997, or other consent regimes, but not yet implemented.	
	Submitted application(s), where the project is classified as 'nationally significant infrastructure' under the Planning Act or under Town and Country Planning Act or other consent regimes, but not yet determined.	
Tier 2	National developments identified on the Planning Inspectorate Website and/or the relevant local planning authorities planning portal where a scoping report has been submitted.	
Tier 3	Nationally significant infrastructure projects identified on the Planning Inspectorate Website and/or the subject of pre-application discussion with a relevant Local Planning Authority (LPA), where a scoping report has not been submitted. Projects registered on the LPA's portal classed as major development but do not require EIA.	

Hierarchy of other developments	Proposed criteria of other developments	
	Identified in the relevant Local Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited.	
	Identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.	

Stage 2 Establishing a shortlist of 'other existing development and/or approved development'

21.4.11. The long list of other developments was further refined into a 'short list' to establish which other developments may result in likely significant cumulative effects and should therefore be taken forward for further assessment. The following factors were considered when establishing the short list:

- Temporal scope: whether other development has overlapping construction and operation phases with the Preparations for Quiescence and Quiescence phases of the Proposed Works. As the Final Site Clearance phase would occur in approximately 90 – 100 years' time, it is not possible to predict potential cumulative development or changes to existing / proposed developments across this time period;
- Scale and nature: whether the scale and nature of the other development identified in the Zone of Influence (ZoI) was likely to interact with the Proposed Works;
- Other factors: whether any other factors, such as the sensitivity of the receiving environment or uncertainty in the potential effects merit further assessment of the potential cumulative effects; and
- Consultation: requests from Stakeholders for the inclusion of specific projects and/or plans within the CEA.

21.4.12. The long list has been evaluated to produce a short list of other developments which will be assessed within the inter-project CEA. See **Appendix 21B: Inter-project cumulative effects.**

Stage 3: Information gathering

21.4.13. Information on the short-listed developments has been gathered to inform the final CEA where this is available. This includes:

- proposed design and location information;
- construction and operational timescales; and
- results of any environmental assessments completed for the other developments.

21.4.14. Information and data sources used to inform the assessment has been obtained from publicly available sources.

Stage 4: Assessment

21.4.15. The approach to Stage 4 of the assessment accords with the suggested approach in PINS Advice Note 17. The assessment is commensurate with the information available at the time of assessment. Information on some proposals may be limited and such gaps are acknowledged within the assessment. The assessment includes all short-listed Tier 1 and Tier 2 other development, where possible. For short listed other development falling into Tier 3 the assessment presented may be high level, reflective of the level of information available.

21.4.16. The significance criteria used to identify likely significant effects is consistent with the general approach described in **Chapter 5: Approach to Environmental Impact Assessment**, as adapted for specific environmental aspects.

21.4.17. Any measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant cumulative effects and, where appropriate, any proposed monitoring arrangements are identified.

Engagement

21.4.18. Somerset Council has consulted on a draft of the long list in advance of this CEA assessment and their responses are detailed in **Table 21-8** below.

Table 21-8 - Summary of comments raised by Somerset Council

Comment	Response
The determining authority for DCO projects is the Secretary of State.	This has been updated in the long list.
The development of 27 residential properties on land at Paddons Farm, Stogursey (3/32/20/009) has not been included in the long-list, although it is understood that the development is substantially completed.	It has been assumed that the development will be complete prior to the start of decommissioning works, and thus forms part of the future baseline.
Local Plan allocations should be included to ensure a more comprehensive assessment, in line with the EDF Energy HPC 'long list' (for their consultation exercise on the proposed Material Amendments)	The long list for the forthcoming Material Change application for HPC will differ as the amendments proposed have a greater geographical extent compared to the Proposed Works. The only allocations considered to be relevant in respect of the zone of influence for the Proposed Works comprise Planning Allocation D33 in Sedgemoor Local Plan 2011 – 2032 (ID 35).

Assessment of inter-project effects

21.4.19. A long list of developments has been produced based on the methodology set out above. This is provided in **Appendix 21B: Inter-project cumulative effects** of this chapter and was agreed with Somerset Council in Spring 2024.

21.4.20. **Figure 21.1: Long list of cumulative development schemes** identifies the location of these developments.

21.4.21. The potential effects of the Proposed Works in conjunction with the committed developments listed and described above are discussed below in relation to each of the technical aspects identified as having potential cumulative effects.

Assumptions

21.4.22. The following assumptions have been made in the assessment of cumulative effects:

- It is assumed that all of the developments identified within **Appendix 21B: Inter-project cumulative effects** would be completed and operational prior the Quiescence phase (with the exception of Hinkley Point A decommissioning).
- It is anticipated, as for the Proposed Works, that other proposed/committed developments will implement appropriate embedded measures during their respective construction phases which will help to prevent/minimise adverse effects during construction and avoid potential cumulative effects should construction periods overlap with that of the Proposed Works.
- The assessment has been completed based on information relating to the committed developments which is available within the public domain.
- It is noted that there is a consent for Huntspill Energy Park (42/13/00010) (referred to as the Extant Permission) for the Gravity Local Development Order (LDO) site (Site ID 37 in **Appendix 21B: Inter-project cumulative effects**), which was granted in 2017. After the consent was granted in 2017, the site was classified as an Enterprise Zone in 2017, and it was decided to pursue an LDO to allow a more flexible planning process to bring forward development on this site. The Section 106 for the Gravity LDO (2022)[9] notes that the upon commencement of the LDO development, the S106 for the Extant Permission is automatically release and no further development pursuant to the Extant Permission is permitted. To date, Stage One Strategic Landscaping (95/23/00001) has been accepted on the Somerset Council planning portal. On this basis, it is assumed for the purposes of the cumulative effects assessment, LDO is being progressed and the Extant Permission is no longer valid.

21.5 Aspect assessment of cumulative effects

Air Quality

21.5.1. Other developments have the potential for generating cumulative air quality effects in a number of ways:

- Generation of additional road traffic. The impacts from road traffic emissions associated with the Proposed Works to human and ecological receptors has been considered by undertaking a screening assessment. The need to undertake a detailed assessment of these emissions was scoped out and the potential impacts are not expected to be significant. It is therefore not necessary to consider these separately.

[9] Womble Bond Dickinson (2022) Agreement. Available at: thisisgravity.co.uk/wp-content/uploads/2022/02/Gravity-Section-106-Agreement-dated-23-Feb-22.pdf (Accessed August 2024).

- Generation of dust during construction. The impacts of the dust emissions expected during the Proposed Works have been assessed and are reported within **Chapter 6: Air Quality, Section 6.8**.

21.5.2. A short list of other development has been generated by screening each within the long list. A ZoI has been considered and those within the ZoI have been screened into the short list of other developments. The ZoI that has been used is that which relates to impacts from dust emissions. For air quality, a ZoI of 250 m (as reported in **Chapter 6: Air Quality, Section 6.7**) has been applied for the CEA to ensure direct and indirect cumulative effects can be appropriately identified and assessed.

21.5.3. The other development that has been brought forward for consideration in the CEA after applying a ZoI of 250 m from the Proposed Works comprises the ongoing decommissioning works at HPA. This is because HPC operation and future decommissioning are outside of the 250m ZoI.

21.5.4. Decommissioning works associated with the Preparations for Quiescence phase equivalent of HPA form part of the existing baseline and therefore considered inherently within the assessment presented in **Chapter 6: Air Quality, Section 6.8**.

21.5.5. The sizeable works associated with Final Site Clearance at HPA are expected to take place during the Quiescence phase of the Proposed Works, therefore there are no cumulative effects expected with this other development with regard to impacts from dust emissions. Notwithstanding the above, it is anticipated that dust mitigation measures would be implemented during potentially dusty activities at HPA which would limit the potential for significant effects in-combination with the Proposed Works. Therefore, with the proposed mitigation for construction dust impacts in place, all effects are predicted to be negligible.

Climate Change

21.5.6. All global cumulative greenhouse gas (GHG) sources are relevant to the effect on climate change, and this is taken into account in defining the receptor as being of 'high sensitivity'.

21.5.7. Effects of GHG emissions from specific cumulative projects are not assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other.

21.5.8. Additionally, the contextualisation of GHG emissions, by its nature, incorporates the cumulative contributions of other GHG sources which make up that context. Therefore, it has not been necessary to carry out a separate CEA of GHG emissions as part of this ES. This approach is in accordance with IEMA guidance.[10]

Terrestrial Biodiversity and Ornithology

21.5.9. Cumulative effects on ecological features could occur due to the combination of the Proposed Works and other plans and projects. This includes the construction and operation of HPC (including the material change application) and decommissioning works at HPA. Major infrastructure development work was ongoing throughout the HPC site leading up to and during baseline data collection at HPB in 2019 and 2020, and Baseline Verification in 2022, following earlier phases of site clearance and

[10] IEMA (2022). Environmental Impact Assessment Guide to: Assessing Greenhouse Gas Emissions and Evaluating their Significance – 2nd Edition (online). Available at: https://www.iema.net/resources/blog/2022/02/24/launch-of-the-updated-eia-guidance-on-assessing-ghg-emissions (Accessed August 2024).

enabling/preparatory works. Decommissioning works at HPA were simultaneously in the Care & Maintenance Preparations phase, which is the main phase of de-planting, dismantling and demolition, equivalent to the Preparations for Quiescence Phase at HPB.

21.5.10. Construction of HPC commenced in 2017 (though some enabling works began earlier than this) and is due to complete around the end of the decade. The majority of direct effects associated with the construction of HPC, including habitat loss and potential effects on ecological features would have already occurred and indirect effects are likely to be ongoing as construction continues, and inherently forms part of the baseline for the main assessment presented in **Chapter 8: Terrestrial Biodiversity and Ornithology** of this ES. The assessment therefore already considers the effects arising from the Proposed Works in conjunction with the construction of HPC. Construction activity at HPC will gradually decrease during the Proposed Works as the station becomes operation and landscaping is undertaken. However, as the Proposed Works are highly localised, this will not impact on landscape restoration proposals associated with HPC. The predicted effects of Very Low/Low magnitude associated with the Proposed Works are unlikely to elevate the magnitude or significance of cumulative effects on ecological features above those associated with the HPC development.

21.5.11. HPA separates the Works Area from HPC to the west and like HPB is predominantly hard standing and built infrastructure. The effects of HPA decommissioning are therefore likely to be very similar to those associated with the Proposed Works, with limited scope for significant effects on terrestrial biodiversity and effects on ecological features minimised or mitigated through the HPA Environmental Management Plan. The HPA EMP includes measures similar to those embedded into the Proposed Works, including timing activities to avoid sensitive periods for breeding and wintering birds and rewilding habitats around the HPA site, plus use of nesting bird deterrents. Implementation of the HPA EMP in 2021/22, immediately following baseline data collection at HPB, was informed by habitat and protected species surveys and concluded that the ongoing HPA decommissioning activities are likely to have no significant effects on terrestrial biodiversity[11].

21.5.12. In addition, non-operational areas of the Site currently continue to be managed for biodiversity conservation by EDF in accordance with the HPB Integrated Land Management Plan (LMP) and the site's certification under the Wildlife Trusts' Biodiversity Benchmark. Biodiversity monitoring in these areas is undertaken annually to assess progress against management plan objectives and is reported in Land Management Annual Reviews (LMARs). This annual review process continues to inform refinements to the ILMP with a view to targeting and optimising biodiversity enhancements.

21.5.13. Upon transfer to Nuclear Restoration Services (NRS), formerly Magnox Ltd, after the completion of defueling, the Site will come under the stewardship of the NRS/Magnox Sustainability Strategy. As part of this strategy, there is a commitment to conserve/enhance biodiversity on NRS decommissioning sites..

[11] Magnox Ltd (2022) Hinkley Point A Site: Environmental Management Plan 2021/22 Available online: Magnox Limited - Hinkley Point A Site - Environmental Management Plan 2021/22 (onr.org.uk) (Accessed August 2024).

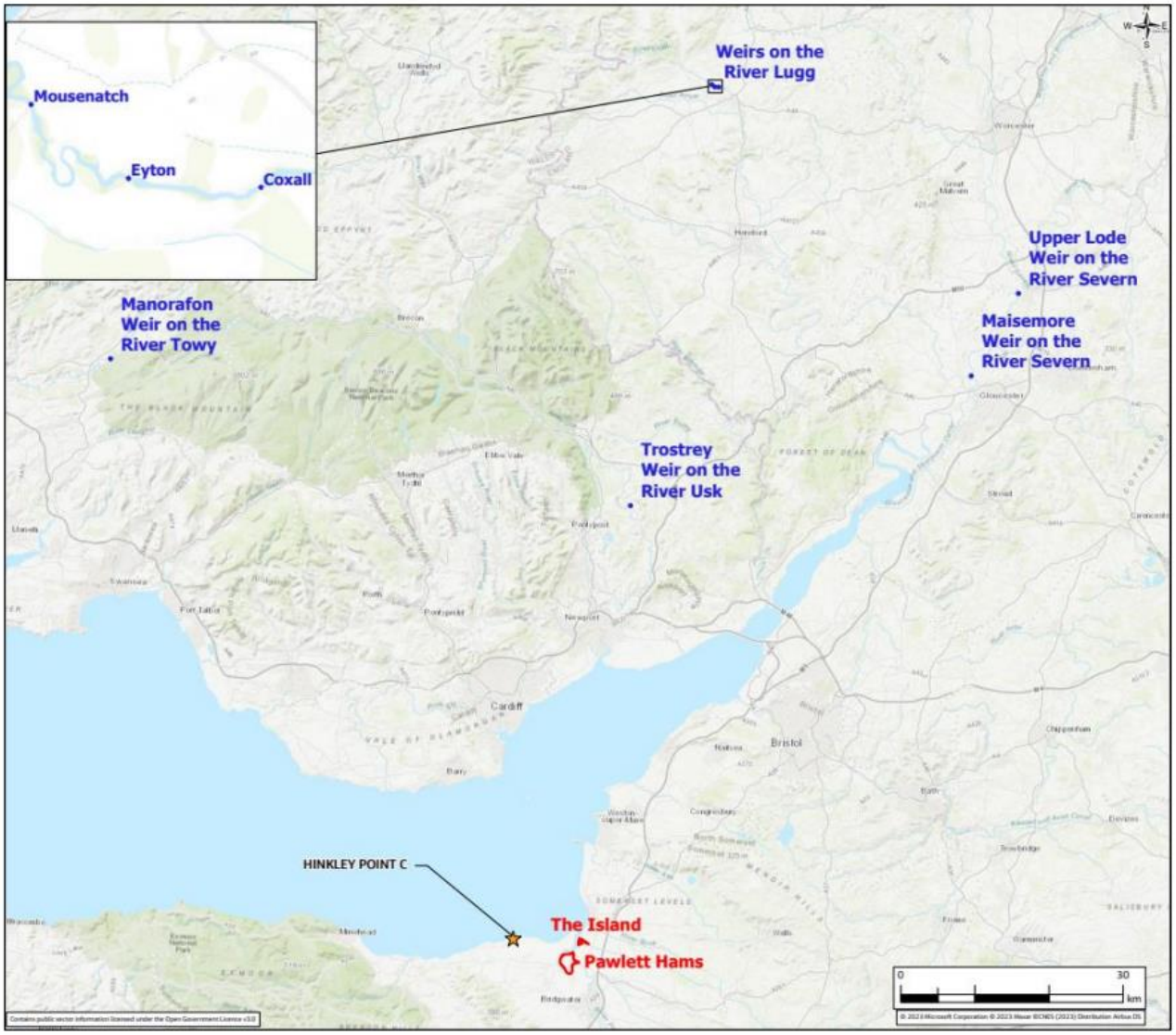
21.5.14. NNB Generation Company (HPC) Limited ('NNB') is intending to submit an application for a material change to the approved Development Consent Order for HPC. At the time of writing, no application has been submitted, however consultation was undertaken in between January and February 2024. The proposed changes to the HPC application comprise changes within the Main HPC Site as well as new habitat creation and enhancement measures off-site. As set out in the Preliminary Environmental Information Report (PEIR)[12] prepared for consultation, the changes proposed on the main HPC are considered not likely to affect terrestrial ecology and ornithology and were scoped out of further assessment.

21.5.15. **Graphic 21-2** sets out the proposed locations for offsite compensation by HPC, of which only 'The Island' and 'Pawlett Hams' are located close to the Proposed Works. However, as the application has not yet been submitted, the full assessment of effects is not yet available. The PEIR13 identified that effects associated with these sites are primarily related to habitat loss and consequential effects on sites of interest and protected species, however, it is considered unlikely that the Proposed Works would interact and contribute to a greater effect based on distance to the proposed sites and that the effects arising from the Proposed Works reported in Chapter 8: Terrestrial Biodiversity and Ornithology were concluded to be Very Low or Neutral in nature. However, at the time the material change application is made, the assessment would also need to consider the proposals in the context of the Proposed Works and whether a cumulative effect is possible.

[12] HPC (2024). Preliminary Environmental Information Report (PEIR) Volume 2 - Proposed Changes On-Site. Accessible at: HPC PEIR 2023 Vol 2_final.docx (edfenergy.com). (Accessed August 2024)

[13] HPC (2024). Preliminary Environmental Information Report (PEIR) Volume 3 - Proposed Changes Off-Site. Accessible at: [13] PEIR Volume 3_final.docx (edfenergy.com) (Accessed August 2024)

Graphic 21-2 - Extract from HPC PEIR Materials, Location of offsite changes proposed HPC.



Marine Biodiversity

21.5.16. There is very limited potential for marine biodiversity effects associated with the Proposed Works, as outlined described in **Chapter 9: Marine Biodiversity**. This is because the small scale of the works limits the potential to interact with or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

21.5.17. However, given the scale of construction works adjacent to the Site, at HPC, this should be specifically considered. As described in **Chapter 9: Marine Biodiversity, Section 9.5**, the majority of the marine infrastructure associated with HPC has now been installed, with the only major works remaining being removal of the temporary jetty and installation of the fish deterrent system remaining. These works are anticipated to involve the presence of vessels and potentially other plant in the intertidal and subtidal environments; however, based on the scale of the proposed scheme, and the short-term nature of the works, both temporally and spatially, significant cumulative effects are not anticipated.

21.5.18. Other major works in this region include the Bridgwater Tidal Barrier, that will extend across the River Parrett at the Bridgwater Express Park. This is approximately 30 km along the coast and up the river from HPB therefore there is no realistic scope for interaction with the Proposed Works.

Coastal Management and Water Quality

21.5.19. Cumulative effects on coastal process and water quality could occur due to the combination of the Proposed Works and other plans and projects. This includes a small number of projects which interact with the marine environment. Other projects listed are all terrestrial in nature or outside of the Study Area and will have no substantial interaction with the sea through run-off or piped discharges and therefore are not considered further.

21.5.20. There is very limited potential for coastal effects associated with the Proposed Works. This is because the small scale of the Proposed Works limits the potential to interact with or combine with the effects arising from other developments or projects proposed within the relevant Zones of Influence applicable to each environmental aspect.

21.5.21. However, given the scale of construction works adjacent to the Site, at HPC, this should be specifically considered. The majority of the marine infrastructure associated with HPC has now been installed, with the only major works remaining being removal of the temporary jetty and installation of the FRR system remaining. These works are anticipated to involve the presence of vessels and potentially other plant in the intertidal and subtidal environments; however, based on the scale of the proposed scheme, and the short-term nature of the works, both temporally and spatially, significant cumulative effects are not anticipated.

Surface Water and Flood Risk

21.5.22. With the exception of the ongoing construction of HPC and decommissioning of HPA, each of the other projects listed in **Appendix 21B: Inter-project cumulative effects** are sited outside of the Study Area for the surface water and flood risk aspect.

21.5.23. Decommissioning works are already underway at HPA, to the west of the Site. Nuclear Restoration Services are committed to maintaining the tidal flood defence wall along the northern boundary of the HPA Site which will also provide some protection to HPB.

21.5.24. It is understood that HPA has a separate surface water drainage system to HPB and, being at a higher level, is effectively a separate sub-catchment for surface water runoff. Therefore, there are no significant inter-project effects regarding surface water runoff quality or quantity.

21.5.25. Construction works are taking to the west along the Hinkley Point frontage, at HPC, where new defences to a 1 in 10,000 year level of protection have been constructed, ensuring that there will be no increase in tidal flood risk to HPB as a result of these works.

21.5.26. No significant inter-project surface water and flood risk effects between the Proposed Works and other developments are anticipated.

Soils, Geology and Hydrogeology

21.5.27. For land contamination receptors the ZoI beyond the Works Area used in the assessment is 1 km. This is based upon the potential for contaminants to migrate off-site or to migrate onto the Site from off-site sources. Based on this ZoI the Proposed Works have the potential to result in inter-project cumulative effects with works at the neighbouring HPA and HPC beyond to the west.

21.5.28. With the embedded measures for the Proposed Works, and as HPB, HPA and HPC are all subject to the specific environmental and operational controls applied within nuclear power generation sites / new nuclear power generation sites regulated through the planning process and associated environmental permitting, it is considered that the potential for significant cumulative effects to arise from other projects and plans in conjunction with the Proposed Works is unlikely. Measure 12.2 identified in **Chapter 12: Soils, Geology and Hydrogeology Table 12-7** relates to the licensee's compliance with Radioactive Substances Regulation (RSR) 2018 [14], and this also applies at the neighbouring HPA station, notably requiring the condition of all the sites to meet regulators standards for the protection of people and the environment, now and into the future. HPC is under construction and subject to planning conditions to manage environmental impacts.

21.5.29. For other developments on non-nuclear sites, the planning regime for land contamination requires that development sites are demonstrated to be 'suitable for use' and that they are not capable of being designated as Part IIA[15] Contaminated Land. The use of industry guidance for land contamination assessment such as Land Contamination Risk Management (LCRM) and BS10175 (as set out in **Chapter 12: Soils, Geology and Hydrogeology Table 12-7**) is standard within land contamination management (and land contamination is typically 'conditioned' as part of planning approvals). Alongside compliance with Construction (Design and Management) CDM and the Health and Safety at Work Act (1974)is a legal requirement for all construction projects, these lower the potential for inter-project effects.

Historic Environment

21.5.30. Other developments within or near to the Study Area are detailed in **Chapter 14: Landscape and Visual Impact Assessment.** Of these, the ongoing decommissioning of the neighbouring HPA and construction of HPC were considered likely significant.

21.5.31. The assessment feeding into **Chapter 14: Landscape and Visual Impact Assessment** identified potential receptors of cumulative effects which overlap with historic environment including views from properties within Stolford and Wick. However, HPC ES (Chapter 23) paragraph 23.5.115 notes that the HPC development site does not form part of the setting for assets affected by the Proposed Works (specifically Stolford Group. Grade II listed Sea View, Stolford Farmhouse, and D'Arches (NHLE 1057379, 1057378, 1308209 and Wick group. Grade II listed Zine Farmhouse and Wick Pound House (NHLE 1175753,1345703)). The chapter then goes on to state, that whilst the HPC development site may be visible from these assets, it does not form part of their setting in the same way HPB does. On this basis, it is considered that cumulative effects on these assets are not significant.

[14] SEPA, Environment Agency, Natural Resources Wales (2018) Management of radioactive waste from decommissioning of nuclear sites: Guidance on Requirements for Release from Radioactive Substances Regulation. Version 1.0: July 2018. (Online) Available at: https://www.sepa.org.uk/media/365893/2018-07-17-grr-publication-v1-0.pdf (Accessed August 2024).

[15] Part IIA of the Environmental Protection Act 1990 [online]. Available at: http://www.legislation.gov.uk/ukpga/1990/43/part/IIA. (Accessed August 2024).

21.5.32. HPC ES (Chapter 23) reported effects on the setting Pixies Mound during early stages of construction due to the construction of the access roundabout (which will have already occurred prior to the commencement of works). HPC committed to a monument management plan being implemented to reduce the level of effect experienced such that it would be not significant. On this basis, it is considered that cumulative effects on these assets are not significant.

Landscape and Visual

21.5.33. The landscape and visual impact assessment presented in **Chapter 14: Landscape and Visual Impact Assessment** of this ES has inherently considered the potential landscape and visual effects of the Proposed Works on their own as well as the Proposed Works with additional cumulative development to ensure a robust assessment has been undertaken. The assessment has adopted detailed guidance, GLVIA3[16], which states that projects included for cumulative assessment should include '*other examples of the same type of development*'. The guidance goes on to state, at paragraph 7.16, that '*Stakeholders . will be concerned about the totality of the cumulative effect of past present and future proposals. Those assessing these effects should reflect these concerns …*'. This distinguishes between 'additional' cumulative effects that would result from adding the Proposed Works to other cumulative development and 'combined' cumulative effects that assess the total cumulative effect of the Proposed Works and other cumulative development. In the latter case a significant cumulative effect may result from the Proposed Works or one or more other existing, under-construction or consented developments, or other development applications. In those cases, the main contributing development(s) is identified in the assessment.

21.5.34. A summary of the inter-project cumulative landscape and visual effects potentially arising from the Proposed Works interacting with other developments is set out in **Table 21-9**. Those levels of effect that are shaded in the table and shown in **bold** relate to significant effects. The development contributing most to the cumulative effects is recorded in brackets.

[16] Landscape Institute and the Institute of Environmental Management and Assessment (2013). Guidelines for Landscape and Visual Impact Assessment. 3rd edition. Routledge; London.

Table 21-9 - Summary of the predicted landscape and visual cumulative effects

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Direct effects on landscape character							
Quantock Vale - Eastern Lowlands Sub-Area	Preparation for Quiescence phase	Low (within the Works Area)	High (within the Works Area)	Moderate and Not Significant within the Works Area	Adverse	Moderate and Not Significant within the Works Area	**Major** to **Moderate** and Significant (HPC construction) **Major** (Year 1) to **Moderate** (Year 15) and Significant (coastal area around Lilstock) to Minor and Not Significant within the remainder of the LCA Sub-Area (HPC operation)
		Medium within the wider LCA Sub-Area	Low reducing to Very Low within the wider LCA Sub-Area to Zero (areas outside of the ZTV)	Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV)		Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV)	
	Quiescence phase	Low (within the Works Area) Medium within the wider LCA Sub-Area	Very Low to Zero (areas outside of the ZTV)	Minor and Not Significant to None (areas outside of the ZTV)	Neutral	Minor and Not Significant to None (areas outside of the ZTV)	**Moderate** and Significant (coastal area around Lilstock) to Minor and Not Significant within the remainder of the LCA Sub-Area (HPC operation)
	Final Site Clearance phase	Low (within the Works Area)	High (within the Works Area)	Moderate and Not Significant within the Works Area	Adverse	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
		Medium within the wider LCA Sub-Area	During Final Site Clearance: Low reducing to Very Low within the wider LCA Sub-Area to Zero (areas outside of the ZTV).	During Final Site Clearance: Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV).	Adverse		
			Post removal of all buildings: Medium within approximately 1.5 km to Low to Very Low to Zero (areas outside of the ZTV).	Post removal of all buildings: Moderate within approximately 1.5 km to Moderate/Minor to Minor and Not Significant to None (areas outside of the ZTV).	Beneficial		
Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area	Preparation for Quiescence phase	High (west of HPC)	Low/Very Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None (west of HPC)	Adverse to Neutral	Moderate/Minor and Not Significant to None (west of HPC)	**Major** and Significant (HPC construction) **Moderate** and Significant (HPC operation)
		Medium (north of	Medium	Moderate and Not Significant (north of HPC/ HPA/HPB)	Adverse	Moderate and Not Significant (north of HPC/ HPA/HPB)	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
		HPC/ HPA/HPB)					
	Quiescence phase	High (west of HPC)	Very Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None (west of HPC)	Neutral	Moderate/Minor and Not Significant to None (west of HPC)	**Moderate** and Significant (HPC operation)
		Medium (to north of HPC/ HPA/HPB)	Very Low	Minor and Not Significant (north of HPC/ HPA/HPB)	Neutral	Minor and Not Significant (north of HPC/ HPA/HPB)	
	Final Site Clearance phase	High (west of HPC)	Very Low to Zero (during Final Site Clearance and post removal of all buildings)	Moderate/Minor and Not Significant to None (west of HPC)	Adverse to Neutral	N/A	N/A
		Medium (to north of HPC/ HPA/HPB)	Medium (during Final Site Clearance and post removal of all buildings)	Moderate and Not Significant (north of HPC/ HPA/HPB)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	
Quantock Vale - Wick Moor and Coast Sub-Area	Preparation for Quiescence phase	Medium	Low to Very Low at the end of the phase	Moderate/Minor to Minor and Not Significant	Adverse	Moderate/Minor to Minor and Not Significant	**Major** and Significant (HPC construction)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase	Medium	Very Low	Minor and Not Significant	Neutral Beneficial within coastal areas due to the removal of built form	Minor and Not Significant	Moderate/Minor and Not Significant (HPA Final Site Clearance phase)
	Final Site Clearance phase	Medium	Low (during Final Site Clearance)	Moderate/Minor and Not Significant	Adverse	N/A	N/A
			Medium (post removal of all buildings)	Moderate and Not Significant	Beneficial		
Indirect effects on landscape character							
Quantock Vale - Wall Common and Coast Sub-Area	Preparation for Quiescence phase	Medium	Low to Very Low at the end of the phase to Zero (areas outside of the ZTV).	Moderate/Minor to Minor and Not Significant to None	Adverse	Moderate/Minor to Minor and Not Significant	Moderate/Minor and Not Significant (HPA Preparations for Quiescence phase)
	Quiescence phase	Medium	Very Low to Zero (areas outside of the ZTV).	Minor and Not Significant to None	Neutral	Minor and Not Significant	Moderate/Minor and Not Significant (HPA Final Site Clearance phase)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Final Site Clearance phase	Medium	Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Visual effects on views from settlements							
Stolford	Preparation for Quiescence phase	High	Medium/Low (localised areas on western edge)	**Moderate** and Significant (localised areas on western edge)	Adverse	**Moderate** and Significant (localised areas on western edge)	**Major/Moderate** and Significant (HPC construction) **Moderate** and Significant (HPC operation)
			Low or Very Low (majority of the settlement)	Moderate to Moderate/Minor and Not Significant (majority of the settlement)	Adverse	Moderate to Moderate/Minor and Not Significant (majority of the settlement)	
	Quiescence phase	High	Low (localised areas on western edge)	Moderate and Not Significant (localised areas on western edge)	Beneficial	Moderate and Not Significant (localised areas on western edge)	**Moderate** and Significant (HPC operation)
			Very Low (majority of the settlement)	Moderate/Minor and Not Significant (majority of the settlement)	Neutral	Moderate/Minor and Not Significant (majority of the settlement)	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Final Site Clearance phase	High	Medium/Low (localised areas on western edge)	**Moderate** and Significant (localised areas on western edge)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Low to Very Low (majority of the settlement)	Moderate to Moderate/Minor and Not Significant (majority of the settlement)			
Wick	Preparation for Quiescence phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Adverse	Moderate to Moderate/Minor and Not Significant	Moderate and Not Significant (HPC and HPA)
	Quiescence phase	High	Very Low	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	Moderate and Not Significant (HPC and HPA)
	Final Site Clearance phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Stogursey	Preparation for Quiescence phase	High	Low/Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Adverse	Moderate/Minor and Not Significant (northern edge of the settlement)	Moderate and Not Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			Zero (majority of the settlement)	None (majority of the settlement)	Neutral	None (majority of the settlement)	
	Quiescence phase	High	Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Neutral	Moderate/Minor and Not Significant (northern edge of the settlement)	Moderate and Not Significant (HPC)
			Zero (majority of the settlement)	None (majority of the settlement)		None (majority of the settlement)	
	Final Site Clearance phase	High	Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Zero (majority of the settlement)	None (majority of the settlement)	Neutral		
Visual effects on views from recreational routes							
King Charles III England Coast Path and West	Preparation for Quiescence phase	High	Low (east of Stolford)	Moderate and Not Significant (east of Stolford)	Adverse	Moderate and Not Significant (east of Stolford)	**Major** and Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Somerset Coast Path (westbound walkers)			Medium/Low to Medium (Stolford to the western edge of the Works Area (2.5 km section))	**Moderate** to **Major/Moderate** and Significant (Stolford to the western edge of the Works Area (2.5 km section))		**Moderate** to **Major/Moderate** and Significant (Stolford to the western edge of the Works Area (2.5 km section))	
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral	None (west of the Works Area)	
	Quiescence phase	High	Very Low (east of Stolford)	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	**Major** and Significant (HPC)
			Low (Stolford to the western edge of the Works Area (2.5 km section))	Moderate and Not Significant	Beneficial	Moderate and Not Significant	
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral	None (west of the Works Area)	
	Final Site Clearance phase	High	Low (east of Stolford)	Moderate and Not Significant (east of Stolford)	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
					Beneficial (post removal of all buildings)		
			Medium/Low to Medium during Final Site Clearance increasing to Medium to High post removal of all buildings (Stolford to the western edge of the Works Area (2.5 km section))	**Moderate** to **Major/Moderate** and Significant during Final Site Clearance **Major/Moderate to Major** and Significant post removal of all buildings (Stolford to the western edge of the Works Area (2.5 km section))	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)		
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral		
King Charles III England Coast Path and West Somerset Coast Path	Preparation for Quiescence phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Adverse/ Neutral	Moderate/Minor and Not Significant to None (west of HPA)	**Major** and Significant (HPC)
			Medium (north of HPA/HPB	**Major/Moderate** and Significant	Adverse	**Major/Moderate** and Significant	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
(eastbound walkers)			(750 m section))				
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral	None (east of the Works Area)	
	Quiescence phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Neutral	Moderate/Minor and Not Significant to None (west of HPA)	**Major** and Significant (HPC)
			Low (north of HPA/HPB (750 m section))	Moderate and Not Significant (north of HPA/HPB (750 m section))	Beneficial	Moderate and Not Significant (north of HPA/HPB (750 m section))	
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral	None (east of the Works Area)	
	Final Site Clearance phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
			Medium during Final Site Clearance	**Major/Moderate** and Significant during Final Site Clearance	Adverse (during Final Site Clearance)		

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			and Medium to High post removal of all buildings (north of HPA/HPB (750 m section))	**Major/Moderate** to **Major** and Significant post removal of all buildings	Beneficial (post removal of all buildings)		
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral		
King Charles III England Coast Path and West Somerset Coast Path (inland diversion)	Preparation for Quiescence phase	High	Low to Zero	Moderate and Not Significant to None	Adverse	Moderate and Not Significant to None	**Major** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major** and Significant (HPC)
	Final Site Clearance phase	High	Low to Zero	Moderate and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Castles & Coast Way	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and	Adverse/ Neutral	Moderate to Moderate/Minor	**Major** to **Major/Moderate** and Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
				Not Significant to None		and Not Significant to None	
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major/Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network A (west of HPC and Shurton Lane)	Preparation for Quiescence phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate/Minor and Not Significant to None	**Major** to **Major/Moderate** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major/Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Local PRoW network B (Stogursey to HPC)	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major** to **Moderate** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network C (Farrington Hill)	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	Major/Moderate to Moderate and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Beneficial/ Neutral	Moderate/Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
					Beneficial (post removal of all buildings)		
Local PRoW network D (Wick to Stolford)	Preparation for Quiescence phase	High	Medium/Low to Medium (local PRoWs 23/95, 23/107 and 23/101)	**Moderate** to **Major/Moderate** and Significant (local PRoWs 23/95, 23/107 and 23/101)	Adverse	**Moderate** and Significant (local PRoWs 23/95, 23/107 and 23/101)	**Major** to **Major/Moderate** to **Moderate** and Significant (HPC)
			Low (remainder of the network)	Moderate and Not Significant (remainder of the network)		Moderate and Not Significant (remainder of the network)	
	Quiescence phase	High	Low (local PRoWs 23/95, 23/107 and 23/101)	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101)	Beneficial	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101)	**Major/Moderate** to **Moderate** and Significant (HPC)
			Very Low (remainder of the network)	Moderate/Minor and Not Significant (remainder of the network)	Neutral	Moderate/Minor and Not Significant (remainder of the network)	
	Final Site Clearance phase	High	Medium/Low to Medium during Final Site Clearance	**Moderate** to **Major/Moderate** and Significant during Final Site Clearance **Major/Moderate** and Significant post	Adverse (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			Medium post removal of all buildings (local PRoWs 23/95, 23/107 and 23/101)	removal of all buildings (local PRoWs 23/95, 23/107 and 23/101)	Beneficial (post removal of all buildings)		
			Low (remainder of the network)	Moderate and Not Significant (remainder of the network)			
Local PRoW network E (Stolford to Stockland Bristol)	Preparation for Quiescence phase	High	Low to Low/Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Low/Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
Local PRoW network F (Hillside Farm to	Preparation for Quiescence phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate/Minor and Not Significant to None	Moderate and Not Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Lower Cock Farm)	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	Moderate and Not Significant (HPC)
	Final Site Clearance phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
Visual effects on views from recreational destinations							
Open Access Land: Man Moor, North Moor, Wick Moor, Great Hooks and Little Hooks, Ham, Sharpham, North Ham, Goose Marsh, Redham	Preparation for Quiescence phase	High	Medium to Medium/Low to Low	**Major/Moderate** to **Moderate** and Significant to Moderate and Not Significant	Adverse	**Major/Moderate** to **Moderate** and Significant to Moderate and Not Significant	**Major** to **Major/Moderate** to **Moderate** and Significant (HPC)
	Quiescence phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Beneficial/ Neutral	Moderate to Moderate/Minor and Not Significant	**Major/Moderate** to **Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Medium to Medium/Low to Low	**Major/Moderate** to **Moderate** and Significant to Moderate and Not Significant	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Visual effects on views from transport routes							
Wick Moor Drove	Preparation for Quiescence phase	Medium	Medium/Low to Low to Low/Very Low to None	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and Significant (HPC)
	Quiescence phase	Medium	Very Low to Zero	Minor and Not Significant to None	Neutral	Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	Medium	Medium/Low to Low to Low/Very Low to None	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A

Cumulative road traffic noise

21.5.35. Data on the additional traffic movements generated by the Proposed Works indicates that the anticipated number of additional traffic movements will be negligible compared to baseline flows and would not cause a significant increase in road traffic noise. On this basis there is negligible potential for cumulative effects due to traffic noise from the Proposed Works. Any cumulative road traffic noise effects would be dominated by vehicle movements associated with other developments, and the requirement to control any such effects would therefore lie with the other developments.

21.5.36. The cumulative effects due to traffic noise are therefore considered to result in impacts of negligible magnitude. With reference to **Chapter 15: Noise and Vibration, Table 15-12**, impacts of negligible magnitude to receptors of high sensitivity result in effects of minor significance and are not significant.

Cumulative noise from activities at HPA and HPC

21.5.37. When considering the potential for cumulative effects during construction, it has been assumed that other proposed and committed developments will implement appropriate mitigation measures during the respective construction phases. This will help to minimise adverse noise effects and avoid potential cumulative effects, where any construction periods overlap with the Proposed Works.

21.5.38. With regard to potential cumulative construction noise effects, it is noted that only those receptors near to the Proposed Works have any potential for significant cumulative effects. This is on the basis that, as indicated by the results provided in **Chapter 15: Noise and Vibration, Table 15-17 and Table 15-18**, three residential receptor locations as well as users of the King Charles III coast path where the predicted noise levels from the Proposed Works are within 10 dB of the significance threshold:

- R3 - Doggets Nordheide;
- R4 - Wick Farm / Headweir House;
- R5 – Stolford;
- R6 – King Charles III Coast Path Position A; and
- R7 – King Charles III Coast Path Position B.

21.5.39. Because of the logarithmic nature of the summation of sound levels, only locations where noise levels from the Proposed Works are within 10 dB of the significance threshold have the potential to experience significant effects due to cumulative noise from construction of other developments and noise arising from the Proposed Works.

21.5.40. Therefore, only those developments which are considered to have the potential to influence the receptors listed above have been considered in detail. At the other receptor locations, R1 and R2, cumulative noise effects are likely to result in effects of no greater than negligible magnitude. With reference to **Chapter 15: Noise and Vibration, Table 15-12**, impacts of negligible magnitude to receptors of high sensitivity result in effects of minor significance and are not significant.

21.5.41. Developments identified that are considered to have the potential to result in cumulative inter-project effects at receptors R3, R4, R5, R6 and R7 are addressed in **Table 21-10** below.

Table 21-10 - Assessment of inter-project cumulative effects

Project	Description of development [Application ref.]	Assessment of cumulative effects
Hinkley Point A (HPA)	HPA is a nuclear power station undergoing decommissioning. The site is now focused on the safe and secure retrieval, packaging and storing of its legacy waste. Priorities for the site include completing the commissioning of the plant required to process, treat, encapsulate, and store intermediate level waste on site until a UK geological disposal facility becomes available. Significant progress is also being made on asbestos hazard reduction from boiler houses and other areas across the site.	Review of the Hinkley Point A Site Strategic Environmental Assessment Site Specific Baseline indicates that the potential for cumulative effects is minimal. Therefore, the likely cumulative effects due to noise emissions arising from this development are considered to be of negligible magnitude.
Hinkley Point C (HPC)	HPC is a nuclear power station undergoing construction. On 19 March 2013 the Secretary of State for Energy and Climate Change granted a Development Consent Order (DCO) to EDF Energy to build and operate Hinkley Point C and associated development. The decision follows the submission of EDF Energy's application to the Infrastructure Planning Commission (now the Planning Inspectorate) on 31 October 2011.	Based on the HPC Construction noise monitoring data (2016 – 2020) presented in **Table 15.7** the potential for combined effects is minimal. Therefore, the likely combined effects due to noise emissions arising from this development are considered to be of negligible magnitude.

21.5.42. The assessment of cumulative effects presented in **Table 21-10** indicates that the likely cumulative effects from other developments will be of no greater than negligible magnitude. With reference to **Chapter 15: Noise and Vibration, Table 15-12**, impacts of negligible magnitude to receptors of high sensitivity result in effects of minor significance and are not significant.

21.5.43. A review of surrounding developments has been undertaken on the long list of developments in **Table 21B-1: Inter project cumulative effects long list** in **Chapter 21: Cumulative Effects Assessment** of this ES.

21.5.44. From the long list, four development sites have been considered relevant and out of which three are included in the existing road capacity review using the DMRB TA 79/99 as they share same route as the Proposed Works, further details are provided in **Table 21-11.** Although TA 79/99 has been withdrawn, the guidance is still widely used to provide an initial indication of likely link capacities along the network.

Table 21-11 Development from the long list progressed to short-list

Site ID	Summary
1	Hinkley Point C New Nuclear Power Station (application ref: EN010001, National Grid ref: ST 21043 45928). Proposal for a nuclear power station with two nuclear reactors capable of generating a total of up to 3,260MW of electricity at Hinkley Point C and subsequent non-material or material amendments. This development has been under construction since 2017 and is expected to begin generation at the end of the decade. Whilst this is considered in the long list, as construction has been ongoing for some time, and is located close to the Proposed Works, it has been considered within the main assessment presented in **Chapter 16: Traffic and Transport** of the ES. Therefore it is not considered further within the cumulative effects assessment presented in this chapter.
7	Land to the south of Quantock Road (application ref: 23/19/00002, National Grid ref: ST 28466 37016). Hybrid (full and outline) application. Full application for the erection of 114 dwellings, formation of signal-controlled access off Quantock Road with associated infrastructure, landscaping and open space (phase 1). Outline application with all matters reserved for the erection of up to 240 residential dwellings with associated infrastructure, landscaping and open space (phase 2).
10	Land at Cokerhurst Farm, south of Wembdon Hill and north of Quantock Road (application ref: 51/19/00003, National Grid ref: ST 27723 37241). Hybrid (full and outline) application. Full application for the erection of 238 dwellings, formation of two new means of access onto A39, pedestrian/cycle link onto Wembdon Hill, public open space, parking and landscaping. Outline application with all matters reserved, for up to 437 dwellings, 500sqm (A1-A5) and/or community uses (D1)), 2.2ha site for up to 2 Form Entry Primary School and bus gate/emergency access via Inwood Road with associated infrastructure, landscaping and works.
13	Land to the East of Brymore Way, between Withiel Drive and Chads Hill, Brymore Way,(application ref: 13/23/00032) Full application with Erection of 160no. dwellings, creation of vehicular, pedestrian and cycle access, public open space, landscaping and associated works
14	Land to the East of Brymore Way, between Withiel Drive and Chads Hill, Brymore Way(application ref: 36/23/00011) Erection of 58 dwellings (40% affordable units) with access, landscaping, parking, public open space and associated works.

Site ID	Summary
15	Mill Farm Caravan Park, Watery Lane, Fiddington (application ref: 28/23/00013) Change of use to allow all-year round tourism & temporary use, existing caravan storage to 45 pitches for temporary use and change of use of agricultural land for storage of 100 caravans.
16	Inwood Farm, Cannington Road, Nether Stowey (application ref: 36/22/00024) Change of use of agricultural field for the provision of caravan pitches and continuation of existing caravan site for use by HPC workers until 31 December 2025. Erection of welfare building and bus shelter. Development of a footpath from site to Nether Stowey village.
37	Gravity Local Development Order (LDO) to the east of Junction 23 of the M5, in Sedgemoor, Somerset. The description of development allowed under the LDO includes: (a) any operations or engineering works necessary to enable the development of the Site, including demolition, excavation and earthworks, the formation of compounds for the stockpiling, sorting and treatment of excavated materials, import of material to create development platforms, piling, and any other operations or engineering necessary for site mobilisation, office and worker accommodation, communications, drainage, utilities and associated environmental, construction and traffic management. (b) the development of a smart campus including: i. commercial building or buildings with a total Gross External Area of up to 1,000,000m 2 which would sit within current Use Classes E (a)- (g), B2, B8 and sui generis floorspace uses and ii. a range of buildings up to 100,000m 2 within Use Classes C1, C2, E (a) (g), F, B8, including restaurants / cafes, shops, leisure, education, and sui generis uses; and iii. up to 750 homes in Use Class C3. together with associated infrastructure including restoration of the railway line for passenger and freight services, rail infrastructure including terminals, sidings and operational infrastructure and change of use of land to operational rail land, multi-modal transport interchange, energy generation, energy distribution and management infrastructure, utilities and associated buildings and infrastructure, digital infrastructure, car parking, a site wide sustainable water management system and associated green infrastructure, access roads and landscaping. Located on the Site of the consented Huntspill Energy Park (App ref. 42/13/00010) referred to as the 'Extant development'. The Gravity LDO does not overlap with the Study Area for the Proposed Works, however, as it will utilise M5 Junction 23, it has been considered within this cumulative effects assessment.

Site 7 – Land to the south of Quantock Road

21.5.45. This hybrid (full and outline) application was submitted by Persimmon Homes in March 2019. This application comprised a full application for the erection of 114 dwellings, formation of signal - controlled access off Quantock Road with associated infrastructure, landscaping and open space (phase1) and an outline application with all matters reserved for the erection of up to 240 residential dwellings with associated infrastructure, landscaping and open space (phase 2).

21.5.46. This hybrid (full and outline) application was submitted by Persimmon Homes in March 2019 and as of April 2024, remains under consideration by Somerset Council.

21.5.47. The development site is located on part of a housing allocation on the draft Sedgemoor Local Plan (which since the formation of Somerset Unitary Authority) is no longer being progressed, with a new local plan proposed within the decade.

21.5.48. The application would deliver 353 homes and would be accessed off A39 Quantock Road and was accompanied by an ES and Transport Assessment. With respect to the transport Study Area, across the ES and Transport Assessment, consideration was given to the potential effects on users of the following roads:

- Within the Transport Assessment:
  - A39 Quantock Road along the site frontage.
  - A39 Homberg Way/Quantock Road/A39 Quantock Road/Quantock Meadow junction.
  - Alexandra Road/North Street/Wembdon Road junction.
  - Penel Orlieu/Broadway/West Street/North Street junction.
  - Taunton Road/ A38 Broadway/ A38 Taunton Road/Broadway junction.
  - A38 Bristol Road/A38 Bristol Road/The Drove junction.
- Within the ES:
  - Taunton Road/ A38 Broadway/ A38 Taunton Road/Broadway junction.
  - A38 Bristol Road/A38 Bristol Road/The Drove junction.

The assessment was informed by surveys undertaken in June 2016 and November 2017. This would have been when HPB was a generating station and in full generation, with a workforce of approximately 550 EDF staff and 200+ contractors.

21.5.49. **Table 21-12** presents an extract from the Transport Assessment submitted with this application showing the forecasted trip generation from this development is summarised in **Table 21-12** below.

Table 21-12 - Site 7 land to the south of Quantock Road trip generation

	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
Total trip generation	329	353	682	172	125	297	6,857

Note:

1. Peak hour has been converted to AADT using a conversion factor of 14.00892.

21.5.50. The assessment concluded that the forecast percentage increases in both total traffic flows and HGV flows are less than 3% during construction, and less than 7% during operation. As flows were less than 10% compared to existing flows further assessment in the ES Chapter was not undertaken.

21.5.51. Based on the trip distribution provided in Appendix A of the submitted TA, the trip generated would be distributed to HPB Route 1 and Route 2 as in **Table 21-13**. However, as noted above, HPB was a generating station at the time of the application, and therefore when the assessment for Site 7 was undertaken, HPB baseline flows from the station are inherent within the baseline collected.

Table 21-13 - Site 7 land to the south of Quantock Road trip distribution

Road Name	Trip Proportion (%)	HPB Route	Trip Generation		
			AM Peak	PM peak	Average
A39 Quantock Rd	63.77%	Route 1	435	189	312
A39 Homberg Way	17.40%	Route 1	119	52	85
The Drove	11.98%	Route 1	82	36	59
A38 Bristol Way to M5 J23	11.98%	Route 1	82	36	59
The Broadway	52.69%	Route 2	359	156	258
A38 Taunton Road	17.40%	Route 2	119	52	85

Site 10 – Land at Cokerhurst Farm

21.5.52. This is a hybrid (full and outline) application submitted by Cavanna Homes Limited in March 2019 and consented in August 2023.

21.5.53. The development would include 675 and two new means of access onto the A39, pedestrian/cycle link onto Wembdon Hill. The application was accompanied by an ES and Transport Assessment. With respect to the transport Study Area, across the ES and Transport Assessment, consideration was given to the potential effects on users of the following roads:

- Skimmerton Lane/ A39 Quantock Road priority crossroad
- A39 Homberg Way/ Quantock Road/ A39 Quantock Road/ Quantock Meadow (Whitegate) priority roundabout
- Penel Orlieu/ Broadway/ West Street/ North Street signalised crossroad
- A39 Homberg Way/ B3339 Wembdon Rise signalised T-junction
- B3339 Wembdon Rise/ Inwood Road priority T-junction
- Broadway/ Retail Park (Morrisons) signalised junction
- A38 Broadway/ A38 Taunton Road signalised crossroad
- A38 Broadway/ Salmon Parade signalised junction
- A38 Monmouth Street/ A372 St John Street/ A38 Broadway/ Eastover signalised crossroad
- A38 Bristol Road/ A39 Bath Road/ A38 Monmouth Street/ The Clink (Cross Rifles) priority roundabout
- A38 Bristol Road/ The Drove signalised T-junction
- A38 Bristol Road/ Wylds Road priority T-junction
- Wylds Road/ A39 The Drove/ East Quay/ A39 Western Way signalised crossroad
- Chilton Street/ A39 Western Way signalised crossroad.

- Victoria Road/ North Street/ Wembdon Road priority mini-roundabout
- Showground Road/ A38 Taunton Road/ Stockmoor Drive priority roundabout
- A38 Taunton Road/ Huntworth Business Park access/ Wilstock Way (Huntworth) signalised roundabout; and
- A39/ A38 Bristol Road/ employment access (Dunball) priority roundabout.
- M5 Junction 23
- M5 Junction 24

21.5.54. Table 12 of the submitted TA[17] summarises the total proposed development trip generation as shown in **Table 21-14** below.

Table 21-14 - Site 10 Cokerhurst Farm trip generation (two-way)

	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
Total trip generation	191	372	563	293	176	471	7,243

Note: Peak hour has been converted to AADT using a conversion factor of 14.00892.

21.5.55. Based on the trip assignment provided in the Transport Assessment, the split of trip generation from Cokerhurst Farm development between HPB Route 1 and Route 2 would be 42% (217 vehicles) and 34% (176 vehicles) respectively. As HPB was a generating station at the time of the application and when the assessment for Site 10 was undertaken, HPB baseline flows from the station would form an inherent part of the baseline collected. The ES chapter concluded no significant effects.

Site 13- Land to the East of Brymore Way

21.5.56. A full planning application was submitted by Pegasus Planning Group Ltd on 01 December 2023 for a new development comprising erection of 160no. dwellings, creation of vehicular, pedestrian and cycle access, public open space, landscaping and associated works. The application is still under consideration at the time of writing.

21.5.57. The application was accompanied by a Transport Assessment.

21.5.58. **Table 21-15** presents the trip generation forecasted for this development proposal which has been extracted from the submitted Transport Assessment[18].

[17] M-EC (Feb 2020), Proposed Mixed Use Development, Cokerhurst Farm, Bridgwater: Transport Assessment (report ref: 21346/02-19-5872 Rev D).

[18] *Proposed Erection of 160 no dwelling, East of Brymore Bay, Cannington, Bridgwater*, *Transport Assessmen*t (report ref: P22-2452 TR02).

Table 21-15 Site 13 Land to the East of Brymore Way trip generation (two-way)

	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
Total trip generation	21	56	77	49	22	71	1037

Note: Peak hour has been converted to AADT using a conversion factor of 14.00892.

21.5.59. The **Transport Assessment** assumes 68% of the trip generation would be using the A39 East and 13% using A39 Cannington Bypass (see **Table 21-16).**

Table 21-16 Site 13 trip distribution to A39 East (two-way)

Route	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
Cannington By Pass (13%)	3	7	10	96	3	9	98
A39E	14	38	52	33	15	48	518

Note: Peak hour has been converted to AADT using a conversion factor of 14.00892.

Site 14 Land At Cricketer Farm

21.5.60. A full planning application was submitted by Strongvox Ltd on 31 May 2024 for 58 dwellings (40% affordable units) with access, landscaping, parking, public open space and associated works. The application is still under consideration at the time of writing.

21.5.61. The application was accompanied by a Transport Assessment. With respect to the transport Study Area, Transport Assessment, consideration was given to the potential effects on users of the following roads:

- A39 and
- St Mary Street.

21.5.62. **Table 21-17** presents an extract from the Transport Assessment[19] submitted with this application showing the forecasted trip generation from this development.

[19] *Proposed Erection of 58 dwelling Land At, Cricketer Farm, Cannington Road, Nether Stowey, Bridgwater*, *Transport Assessmen*t (report ref: P23-0341/TR02).

Table 21-17 Site 14 Mill Farm Caravan Park, Way trip generation (two-way)

	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
Total trip generation	13	34	47	26	20	46	651

Note: Peak hour has been converted to AADT using a conversion factor of 14.00892.

21.5.63. The Transport Assessment assumes 88% of the trip generation would travel using the A39 East as given below.

Table 21-18 Site 14 trip generation to A39 East (two-way)

	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
A39 East (88%)	11	30	41	23	18	40	573

Note: Peak hour has been converted to AADT using a conversion factor of 14.00892.

Site 15 Mill Farm Caravan Park, Watery Lane

21.5.64. Mill Farm Caravan & Camping Ltd sought permission for a touring caravan site at Mill Farm Caravan & Camping Park, located off Watery Lane in the village of Fiddington, near Bridgwater, Somerset.

21.5.65. The proposal does not increase the number of pitches provided at the site and would not result in any additional traffic being generated on a typical holiday period day due to the details of the scheme being proposed[20]. The development is therefore not considered further in terms of cumulative effects.

Site 16 Inwood Farm, Cannington Road, Nether Stowey

21.5.66. HPC Ltd applied for permission for the retention of existing caravan site for use as HPC worker accommodation until 31st December 2025, and a change of use of agricultural land to a caravan site providing and additional 103no. caravan pitches to accommodate HPC workers until 31st December 2025.

21.5.67. The use of the site will only by HPC workers is until 2025 and therefore outside the temporal scope of the Proposed Works, and therefore not considered further.

Capacity review with HPC Operational, Site 7, Site 10, Site 13 and Site 14

21.5.68. Theoretical road capacity has been estimated for each of the road links along the preferred route within the Study Area. The results are summarised in **Table 21-19** and **Table 21-20**.

[20] *Proposed Touring Cravan Site, Mill Farm Caravan & Camping Park, Transport Addendum* (report reference : BTC21101/R/01)

Table 21-19 - Capacity Review Summary year 2030 (including committed development flows – one way)

Link	Survey Location	HPB Route	2030 Baseline Flow (See Note 1)	2030 Committed Dev Flow (See Note 2)	2030 Proposed Works Flow	2030 Baseline Flow + Committed Dev + Proposed Works	Road Type	DMRB TA79/99 Theoretical Capacity	Spare Capacity Without Proposed Works %	Spare Capacity With Proposed Works %
4	A39 Quantock Rd	Route 1	2,434	554	52	3,040	UAP3-7.3m	1,300	-130%	-134%
5	A39 Homberg Way	Route 1	3,114	328	52	3,494	UAP3-7.3m	1,300	-165%	-169%
6	A38 Bristol Road	Route 1	3,384	301	52	3,737	UAP3-9.0m	1,530	-141%	-144%
7	A38 Taunton Road	Route 2	4,748	230	52	5,030	UAP3-9.0m	1,530	-225%	-229%
11	A38	Route 2	1,054	428	52	1,534	UAP2-D2	2,950	50%	48%
12	A39	Route 1	834	301	52	1,187	UAP2-7.3m	1,470	23%	19%
13	A38 to M5 J24	Route 2	849	256	52	1,157	UAP2-6.75m	1,260	12%	8%

Note:

1. 2030 Baseline hourly flow includes HPC construction and existing HPB operational flows.
2. Committed Development hourly flows include sites 7, 10, 13 and 14.
3. Traffic split of light vehicles from committed has been calculated based on Census 2021 WF01BEW – location of usual residence and place of work (OA level) dataset. The dataset criteria are for place of work in West Somerset 004 middle layer super output area (MSOA) and usual residence of all 2011 census merged local authority districts. The selected Census 2021 WF01BEW dataset described in Note 1 indicates existing commuting trips are split into 37% via M5 J23 (northern route), 3% via M5 J24 (southern route) and 60% via local roads.

Table 21-20 - Capacity review summary year 2034 (including committed development flows – one way)

Link	Survey Location	HPB Route	2034 Baseline Flow	2034 Committed Dev Flow	2034 Proposed Works Flow	2034 Baseline Flow + Committed Dev + Proposed Works	Road Type	DMRB TA79/99 Theoretical Capacity	Spare Capacity Without Proposed Works %	Spare Capacity With Proposed Works %
4	A39 Quantock Rd	Route 1	2,425	901	52	3,378	UAP3-7.3m	1,300	-156%	-160%
5	A39 Homberg Way	Route 1	3,108	675	52	3,835	UAP3-7.3m	1,300	-191%	-195%
6	A38 Bristol Road	Route 1	3,378	648	52	4,078	UAP3-9.0m	1,530	-163%	-167%
7	A38 Taunton Road	Route 2	4,739	258	52	5,049	UAP3-9.0m	1,530	-227%	-230%
11	A38	Route 2	1,048	456	52	1,556	UAP2-D2	2,950	49%	47%
12	A39	Route 1	828	648	52	1,528	UAP2-7.3m	1,470	0%	-4%
13	A38 to M5 J24	Route 2	840	284	52	1,176	UAP2-6.75m	1,260	11%	7%

Note:

1. 2034 Baseline hourly flow excludes HPC construction but includes existing HPB operational flows.
2. Committed Development hourly flows include HPC operational flows and sites 7, 10, 13 and 14.
3. Traffic split of light vehicles from committed has been calculated based on Census 2021 WF01BEW – location of usual residence and place of work (OA level) dataset. The dataset criteria are for place of work in West Somerset 004 middle layer super output area (MSOA) and usual residence of all 2011 census merged local authority districts. The selected Census 2021 WF01BEW dataset described in Note 1 indicates existing commuting trips are split into 37% via M5 J23 (northern route), 3% via M5 J24 (southern route) and 60% via local roads.

21.5.69. The assessment of junction capacity undertaken for the cumulative effects assessment indicates that the future baseline condition for the route from the A39 Quantock Road to the A38 Taunton Road and the section of the A38 to the M5 Junction 23 would exceed the theoretical capacity in year 2030 and year 2034 with or without the Proposed Works and committed development.

21.5.70. As driver delays have direct correlation with highway operational capacity and are only likely to cause a significant issue when the traffic on the network within the Study Area on links closes to the Works Area (Links 4-8) (for total flows) is already at or close to the capacity of the system, the above cumulative analysis indicates issues on driver delays are anticipated in the future baseline condition in year 2030 and year 2034. However, this assumes all vehicles pass along these roads.

21.5.71. The constraint in highways capacity and driver delays issues have been recognised by Somerset Council. Previously a new Bridgwater Northern Outer Distributor Road was identified by Sedgemoor District Council as a long-term transport investment to provide additional capacity to accommodate the continued growth in Bridgwater to 2050. The Bridgwater Northern Outer Distributor Road would comprise improvements at junctions and creation of walking and cycling infrastructure, and the scheme would be funded from a combination of development contributions and funding secured from the central government including the £22.6m grant from Bridgwater town deal and £10m from the levelling up funding.

21.5.72. The transport investment strategy for Sedgemoor also includes improvements at the following M5 junctions:

- Junction 23 and A39 (Dunball) signalisation.
- Junction 24 with the A38 (Bridgwater Services/North Petherton) signalisation, localised widening and improved signing and lane marking.

21.5.73. The Proposed Works themselves, contributing to a change in flows of less than 0.5% of total traffic flow based on worst-case peak year traffic flow for the Proposed Works (as set out in Assumptions and Limitations in Section 16.6). Whilst there are capacity constraints on the network when considered cumulatively with other developments (with or without the Proposed Works), Table 21-19 and **Table 21-20** demonstrate that the traffic increase from the Proposed Works alone (during the peak year of the Proposed Works) is expected to be negligible, resulting in a minimal impact on driver delays. Since the Preparations for Quiescence is a temporary phase, and would fluctuate throughout this phase (over the 13 year duration of this phase), the impact during this phase is also considered negligible considering the change from when the Site was operational is minimal. No specific measures are required to mitigate the impact from the Proposed Works, noting commitments already made as part of the transport investment strategy.

Gravity Local Development Order

21.5.74. This Local Development Order (LDO) was made in 2022. As an LDO it provides flexible planning to meet market demands. The documents submitted to support the application for the LDO included a Transport Assessment[21] that included a capacity assessment of Junction 23 of the M5 (which is used by Northern Route (Route 1 for the Proposed Works as the entry point to the M5).

[21] Stantec (2022) Gravity Local Development Order Transport Assessment. Available at: Environmental-Statement-Volume-2-Appendix-9-P4.pdf (thisisgravity.co.uk) (Accessed August 2024).

21.5.75. The trips generated by development associated with the Gravity Local Development Order would largely not impact on Route 1 for the Proposed Works except at Junction 23. Effects on the M5 was scoped out of the main assessment, as set out in the 07 December 2022 Scoping Report, due to its nature, it would not generate any sensitive receptors. Therefore, the trips related to Gravity Local Development Order have not been included in the cumulative impact assessment above because its traffic baseline route differs. However, further high-level consideration is given below at the request to include consideration of the Gravity LDO within the cumulative effects assessment in response to comments raised by Somerset Council and National Highways.

Table 21-21 sets out the DfT baseline data along the relevant junction of the M5.

Table 21-21 DfT baseline data along the relevant junction of the M5

Link	DfT ID	Data Summary	Average Annual Daily Flow Total	Average Annual Daily Flow HGV
M5 – between J24 and J25	56022	2020-Manual Count	71,535	6,392
		2019-Manual Count	78,967	7,458
M5 – between J24 and J23	6022	2020-estimated count	61,173	5,664
		2019-Manual Count	89,031	6,213
M5 – between J23 and J22	47971	2020-Manual Count	82,715	6,986
		2019-estimated count	102,060	8,732

21.5.76. It should be noted that as HPB was a generating station at the time the counts above were undertaken, HPB baseline flows from the station would form an inherent part of the baseline collected. To ensure a worst case assessment was considered, the assessment of traffic during the peak year of the Preparations for Quiescence phase, it was assumed that an additional 100 LGV (two way) and 30 HGV (two way) flows would be required in 2034. Whilst it is not anticipated that all of these movements would require use of Junction 23 of the M5, if they were to use this junction, traffic would be expected to increase overall traffic by 0.4% and HGV traffic by 0.9% at the junction (in a worst-case scenario). These low flows, in combination with the fact the traffic would be

temporary (i.e. would reduce following the end of the Preparations for Quiescence phase), the change is considered to be negligible and **Not Significant**.

21.5.77. Although both the Proposed Works and traffic from Gravity LDO may utilise Junction 23, comparatively, trip generation associated with the Gravity LDO, as set out in **Table 16-44**, is substantially higher, than the Proposed Works.

21.5.78. The Transport Assessment prepared for the Gravity LDO evaluated the junction capacity for the year 2018 without considering any new developments, revealing that the junction is operating at close to full capacity, leading to overflow when the LDO is factored in. The trip generated by the LDO is summarised Table 7-23 of the Transport assessment that has been extracted and tabulated in **Table 21-22** below. Again, it should be noted that as HPB was a generating station at the time of the application and when the assessment for the LDO was prepared, and as such HPB baseline flows from the station would form an inherent part of the baseline collected.

Table 21-22 Trip Generated by Gravity LDO

	AM Peak			PM Peak			AADT (see note)
	Arrival	Departure	Total	Arrival	Departure	Total	
2032	2,080	2,080	4,159	1,905	1,905	3,810	55,783

21.5.79. To mitigate this overflow issue, an upgrade of the junction was discussed as part of the LDO. Testing of the upgraded junction showed that it would operate within capacity and provide improved balancing of traffic flows across the junction. However, due to uncertainties and flexible approach of the LDO, it was accepted that more detailed analysis would be at the LDO Compliance Application stage when there would be greater certainty over the end occupier(s), the scale / form of development coming forward. This is set within the conditions of the compliance check list (including MC11 and MC12)[22] and as such any capacity impacts on Junction 23, arising from development on Gravity site, will be managed (and mitigated) at that time.

People and Communities

21.5.80. The HPA site is undergoing decommissioning with a current published schedule of changes that do not coincide with those at HPB. The decommissioning schedule at HPA indicates entry into Care and Maintenance (NRS' terminology for 'Quiescence') in approximately 2030. This programme would be likely to lead to a substantial reduction in the 195 employees currently employed at HPA, approximately four years after the workforce reduction at HPB in 2026. NRS may also choose to adopt more gradual workforce changes in line with a potential lengthening of their programme. 78.5% of people in the South West region find work within 2 years, a percentage likely to apply to the HPB workers and so the cumulative effects from HPA reductions are expected to be minimal. The workforce reduction at HPB in 2038 also does not coincide with the subsequent Final Site Clearance for HPA which is intended for a 10-year period beginning in approximately 2080 and overlaps with the Quiescence phase for HPB. As such no cumulative effects are anticipated as a result of HPA.

21.5.81. The conditions for future local employment are appreciably enhanced through the operational employment at HPC and other projects likely to offer employment of types which overlap with the skills and experience of the HPB workforce. At the level of the nuclear industry, the NDA Local Social and Economic Impact Strategy is effectively a project which runs alongside nuclear decommissioning work in the UK and provides further cumulative benefits in terms of community and employee support.

Conventional Waste

21.5.82. Other developments have the potential for generating cumulative effects through the generation of additional conventional waste arisings, which will require management at the same network of local waste management infrastructure which the Proposed Works will be reliant upon.

[22] https://thisisgravity.co.uk/download/5278/

Major Accidents and Disasters

21.5.83. Other developments could introduce new receptors for major accidents and disasters hazards and/or introduce new sources of hazards that the Proposed Works might be susceptible to. In addition, **Chapter 19: Major Accidents and Disasters** of the ES identifies resources and receptors within the Study Area which could be impacted in the event of a major accident or disaster due to the Proposed Works.

21.5.84. No adjacent developments have been identified in the ZoI that have not already been considered inherently within the development.

Summary of inter-project cumulative effects

21.5.85. **Table 21-23** presents a summary of the likely inter-project cumulative effects of the Proposed Works interacting with 'other development and plans' in the ZoI.

Table 21-23 - Summary of inter-project cumulative effects

Aspect	Assessment of inter-project effect
Air quality	Not significant
Climate change	Not significant*
Terrestrial biodiversity and ornithology	Not significant
Marine biodiversity	Not significant
Coastal Management and water quality	Not significant
Surface water and flood risk	Not significant
Soils, geology and hydrogeology	Not significant
Historic environment	Not significant
Landscape and visual	Likely significant (in combination with HPC)
Noise and vibration	Not significant
People and communities	Not significant
Traffic and transport	Not significant
Conventional waste	Not significant
Major accidents and disasters*	Not significant

* Inter-relationship effects have been inherently considered within the aspect assessment

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22

Summary of Effects

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22 Summary of Effects

22.1 Introduction

22.1.1. This chapter of the Environmental Statement (ES) summarises the residual effects and conclusions of the Environmental Impact Assessment (EIA) for the Proposed Works.

22.1.2. Residual effects are defined as those effects that remain following the implementation of embedded measures. A summary of the embedded measures, relevant to the Proposed Works is discussed in detail in the relevant environmental aspect chapters of this ES (**Chapters 6** to **21**). The criteria applied to define the significance of residual effects are outlined within **Chapter 5: Approach to EIA**, with further detail provided within the individual environmental aspect chapters of the ES (**Chapters 6**-**21**).

22.2 Summary of Effects

22.2.1. Each environmental aspect chapter considers both the beneficial and adverse residual effects likely to arise from the Proposed Works. The residual effects listed are described with reference to:

- The scale of effect (e.g. negligible, minor, moderate or major) and whether this is significant or not. Where it has been concluded that there will be no effect/no change in relation to specific effects, this has been stated.
- The duration of the effect (i.e. temporary or permanent).
- The nature of the effect (i.e. adverse, neutral or beneficial).

22.2.2. **Tables 22.1** to **Table 22.14** below provide a summary of the residual effects likely to arise from the Proposed Works on an aspect by aspect basis.

Table 22-1 - Summary of residual effects for air quality

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
Ecological	Fugitive dust emissions contributing to loss of amenity and effects on biodiversity areas.	High sensitivity	High risk from demolition activities associated with the Proposed Works. Low risk from construction, earthworks and trackout activities associated with the Proposed Works.	Not Significant	The risk of effects has been concluded without consideration of the application of mitigation measures. With the mitigation measures reported (**Table 6-23**) within applied, the risk of impact from fugitive dust emissions will be Not Significant. The IAQM guidance reports that significant effects on receptors (ecological and human health) are prevented through the application of effective mitigation. Furthermore, this concludes that the residual effect is 'Not Significant'
Human Health	Users of the King Charles III Coast Path	Low sensitivity	Low risk from demolition activities associated with the Proposed Works. Negligible risk from construction, earthworks and trackout activities associated with the Proposed Works.	Not Significant	

Table 22- 2 - Summary of residual effects for climate change

Receptor	Summary of Predicted Effect	Magnitude of Effect	Significance	Summary of Rationale
UK Carbon Budget	Lifetime GHG emissions associated with the Proposed Works are estimated to be 228 ktCO2e. This equates to: 0.002% of the UK's fourth carbon budget, 0.005% of the UK's fifth carbon budget and 0.009% of the UK's sixth carbon budget.	Minor Adverse	Not Significant	The Proposed Works are fully in line with the trajectory of the UK Governments meeting their carbon budgets / targets. Adverse GHG impacts are minimised with good practice design standards and meet the requirements of national, regional and local policy.

Table 22-3 - Summary of residual effects for terrestrial biodiversity and ornithology

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Severn Estuary SAC	Disturbance and degradation of intertidal habitats such as mudflats.	International	Neutral	Not Significant	There will be only limited, localised and temporary disturbance of intertidal habitat within the SAC. Embedded measures will minimise dust mobilisation and dust deposition on SAC habitats. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats within the SAC.
Exmoor and Quantock Oakwoods SAC	Loss or severance of habitats (roosting,	International	Neutral	Not Significant	The Site is at the outer edge of the 6km CSZ around barbastelle roosts

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
	foraging, commuting) used by barbastelle bat, Bechstein's bat and otter, and/or harm to these species, and associated effects on the conservation status of SAC populations of these species				in the SAC. No barbastelle roosts were recorded within the Works Area and levels of barbastelle activity within the Site are low. The Proposed Works will take place within hard standing, with negligible loss of habitat that is of low suitability for bats. The Proposed Works are therefore likely to have a negligible effect on the conservation status of barbastelle. The Site is likely to be beyond the CSZ (1km) of Bechstein bats that roost in the SAC. There are no confirmed records of Bechstein's bat within the Site. The Proposed Works are likely to have a negligible effect on the conservation status of Bechstein bats. Otter was not recorded by the baseline surveys and the Works Area lacks suitable otter habitats.
Severn Estuary SPA & Severn Estuary Ramsar	Disturbance of coastal habitats and displacement of birds, leading to sustained loss of feeding and roosting resource, with adverse effects on the conservation	International	Neutral	Not Significant	There will be only limited, localised and temporary disturbance of intertidal habitat within the SPA/Ramsar. Embedded measures will minimise dust mobilisation and dust deposition on SPA/Ramsar habitats and the predicted increase in road traffic emissions is well below the threshold that is likely to

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
	status of SPA/ Ramsar species populations and assemblages.				have an effect on the conservation status of habitats with the SPA/Ramsar. There are likely to be no effects on core roosts of moulting shelduck. Shelduck aggregations in grid squares within 500m of the Works Area exceed 1% of the SPA population, with peak counts aggregating on the water over two hours either side of the high tide period. These 'rafting' birds were not recorded foraging and did not tend to remain in the same areas for long. Work on the outfall will be at low tide, avoiding the most sensitive high tide periods and limiting shelduck disturbance. Any shelduck that remain within 500m of the Works Area are likely to disperse short distances to other areas of open water with little energetic expenditure. The intake structure is >500 m west of grid squares where shelduck aggregations have been reported. Work on this structure will employ minimal vessel movements, with minimal risk of disturbing shelduck aggregations. Works within the marine environment will also be scheduled as far as

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					reasonably practicable outside the period July to September, avoiding core shelduck moulting periods. Other SPA/Ramsar species were recorded infrequently or in low numbers, or exhibited intermittent/short-term peaks in numbers. There is therefore likely to be low or infrequent use of the ZoI by these species. The Proposed Works are therefore likely to result in no sustained loss of resource (feeding, roosting etc) for these species.
Somerset Levels and Moors SPA & Somerset Levels and Moors Ramsar	Disturbance of coastal habitats and displacement of birds, leading to sustained loss of feeding and roosting resource, with adverse effects on the conservation status of SPA/ Ramsar species populations and assemblages.	International	Neutral	Not Significant	Somerset Levels and Moors SPA and Ramsar site is over 15 km from the Works Area. SPA/Ramsar species were either not recorded by the baseline surveys (e.g Bewick's swan, golden plover, mute swan and shoveler), were recorded infrequently or in low numbers (teal, lapwing, wigeon), or exhibited intermittent/short-term peaks in numbers (pintail). There is therefore likely to be limited or infrequent use of the ZoI by these species. The Proposed Works are therefore likely to result in no sustained loss of

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					resource (feeding, roosting etc) for these species.
Bridgwater Bay SSSI	Habitat loss/degradation; and displacement of birds, leading to sustained loss of feeding and roosting resource, with adverse effects on the conservation status of SSSI species populations and assemblages	National	Neutral	Not Significant	There will be only limited, localised and temporary disturbance of intertidal habitat within the SSSI. Embedded measures will minimise dust mobilisation and dust deposition on SSSI habitats. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats within the SSSI. Ten bird species that are listed on the SSSI citation were recorded infrequently or in low numbers (teal, wigeon, redshank, ringed plover, dunlin and knot), or exhibited intermittent/short-term peaks in numbers (curlew, mallard and turnstone). There is therefore likely to be limited or infrequent use of the ZoI by these species. Work on the outfall is to be undertaken at low tide and any remaining aggregations of shelduck are likely to disperse short distances into other areas of open water.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					The Proposed Works are therefore likely to result in no sustained loss of resource (feeding, roosting etc) for these species.
Somerset Wetlands NNR	Habitat loss/degradation; and displacement of birds, leading to sustained loss of feeding and roosting resource and/or displacement of breeding territories, with adverse effects on the conservation status of NNR species populations and assemblages,	National	Neutral	Not Significant	Bridgwater Bay SSSI forms part of Somerset Wetlands NNR and the effects on the NNR and associated bird species, for example dunlin, knot, ringed plover and shelduck, are the same as the effects on the SSSI. There is limited scope for the Proposed Works to displace breeding territories of bird species associated with the NNR (e.g. reed warbler, skylark, sedge warbler, oystercatcher, peregrine and sparrowhawk), however no more than a small number of breeding territories would be affected and would be displaced into suitable adjacent habitat. The Proposed Works will potentially displace aggregations of oystercatcher, however peak numbers of this species within the ZoI are intermittent, with relatively low numbers recorded in most wintering/passage months. The oystercatcher are likely to disperse

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					to alternative feeding/roosting habitats along the coast. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats within the NNR.
Other SSSIs (Ge-Mare Farm Fields SSSI; The Quantocks SSSI; and Berrow Dunes SSSI)	Habitat degradation due to air quality effects	National	Neutral	Not Significant	Ge-Mare Farm Fields SSSI (6.5 km south-west), The Quantocks SSSI (6.6 km south-west) and Berrow Dunes SSSI (8.8 km north-east) are all over 6 km from the Works Area and this distance means that there is no pathway via which the Proposed Works are likely to have an effect on any of these sites.
Non-statutory biodiversity conservation sites	Habitat loss and/or degradation due to air quality effects, and associated decline in the conservation status of species populations and assemblages (e.g. plants and invertebrates)	County	Neutral	Not Significant	There will be no removal or direct physical disturbance of habitats within any LWS and a negligible effect on the associated species (e.g. plants and invertebrates). Embedded measures will minimise dust deposition on LWSs in particular Hinkley LWS. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats with any LWS.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Habitats	Habitat loss and/or degradation due to air quality effects, and associated decline in the conservation status of associated species populations and assemblages (e.g. plants and invertebrates)	Local	Neutral	Not significant	The Proposed Works are mainly confined to hard standing. Any unavoidable habitat loss will be limited to small areas of habitat types that are common and widespread. Embedded measures will limit the risk of importing or spreading invasive non-native species. The predicted increase in road traffic emissions is below the threshold that is likely to have an effect on the conservation status of habitats.
Bats (barbastelle)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime	International	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					able to utilise other more suitable, adjacent and connecting habitats.
Bats (greater horseshoe and lesser horseshoe.)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime	National	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.
Bats Natterer's, Nathusius' pipistrelle, Leisler's, Daubenton's, brown long-eared and noctule)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to	County	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
	changes to artificial lighting regime				that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.
Bats (common pipistrelle, and soprano pipistrelle)	Loss of potential roost habitat; loss of foraging habitat; and displacement of foraging/ commuting bats, with foraging habitat rendered inhospitable due to changes to artificial lighting regime	Local	Very Low (adverse)	Not Significant	No bat roosts will be lost. The habitats within the Works Area are generally of negligible or low suitability for bats, mainly comprising hard standing that is already extensively illuminated by artificial lighting. The majority of the buildings are of negligible or low suitability for roosting bats. There are no trees within the Works Area that are likely to be suitable for roosting bats. The Preparations for Quiescence and Final Site Clearance phases are likely to result in only limited localised displacement of small numbers of foraging bats and these bats will be able to utilise other more suitable, adjacent and connecting habitats.

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
Breeding birds (Cetti's warbler)	Habitat disturbance, and displacement of breeding territories	County	Very Low (adverse)	Not Significant	There is limited scope for Preparations for Quiescence and Final Site Clearance to disturb and displace a small number of breeding Cetti's warbler territories from the perimeter of the Works Area and into suitable alternative habitats in other parts of Hinkley LWS. This is likely to have a negligible effect on the conservation status of Cetti's warbler.
Breeding birds (Peregrine)	Habitat loss and disturbance and displacement of breeding territories	County	Very Low (adverse)	Not Significant	Preparations for Quiescence and/or Final Site Clearance will potentially displace a pair of peregrine from the Works Area, with associated loss of nesting habitat (buildings). The displaced pair is however likely to find similar, suitable, alternative nesting habitat nearby and this displacement is likely to have a negligible effect on the conservation status of peregrine.
Breeding birds (herring gull)	Habitat loss and disturbance and displacement of breeding territories	County	Low (adverse)	Not Significant	The removal of buildings, combined with decommissioning of marine infrastructure, during the Preparations for Quiescence and/or Final Site Clearance Phase will reduce the available nesting habitat for herring gull and potentially displace approximately 190 pairs of gulls. It is reasonable to conclude

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					that the gulls will be displaced to alternative large flat roofs in the wider area surrounding HPB, with HPC potentially providing additional nesting sites once it has been constructed.
Breeding birds (dunnock, linnet, skylark, song thrush)	Habitat loss and disturbance and displacement of breeding territories	Local	Very Low (beneficial)	Not Significant	Preparations for Quiescence and Final Site clearance will potentially lead to temporary displacement of a small number of breeding territories of birds that are of local biodiversity conservation importance. The longer Quiescence phase will lead to a substantive reduction in disturbance within the Works Area, potentially enhancing nesting opportunities in adjacent areas.
Wintering and passage birds	Habitat loss and disturbance, and displacement of wintering and passage bird species and assemblages	Local	Very Low (adverse)	Not Significant	The assessment of effects of the Proposed Works on assemblages of wintering and passage birds that are reasons for the designation of statutory biodiversity conservation sites are summarised above. The baseline surveys of wintering and passage birds recorded other species infrequently/intermittently or in small numbers. Preparations for Quiescence and Final Site clearance will lead to temporary displacement of small assemblages of birds that are of local biodiversity

Receptor	Summary of Predicted Effect	Importance of ecological feature	Magnitude of Effect	Significance	Summary of Rationale
					conservation importance. The longer Quiescence phase will lead to a substantive reduction in disturbance within the Works Area, potentially enhancing foraging/roosting opportunities in adjacent areas.
Reptiles (grass snake & slow worm)	Loss of reptile habitat and harm and/or displacement of grass snake and/or slow worm	County	Very Low (adverse)	Not Significant	The Proposed Works are to be confined within the Works Area, which is largely devoid of suitable habitat for reptiles. There is likely to be negligible loss of reptile habitat. The Proposed Works include embedded measures that will minimise the risk of harming reptiles.

Table 22-4 - Summary of residual effects for marine biodiversity

Receptor	Summary of Predicted Effect	Receptor importance	Magnitude of Change	Effect and Significance	Summary of Rationale
Intertidal habitats / species	Decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase resulting in smothering from increased sedimentation and loss of *Sabellaria* biotopes	Medium	Very low	Negligible (not significant)	The large tidal range of the estuary and inner Bristol Channel leads to very strong currents throughout the main body of the estuary. The intertidal biota of the estuary is therefore adapted to large magnitude natural changes. Considering the location of the Proposed Works, the magnitude of change on littoral transport to these habitats is considered to be within the range of natural variability. Similarly, a temporary and localised increase in suspended sediment levels as a result of the Proposed Works will not directly impact the biotopes in the surrounding area
	Demolition works and ground remediation during the Preparations for Quiescence and Final Site Clearance phases resulting in the loss of *Sabellaria* biotopes	Medium	Very low	Negligible (not significant)	Run-off from potentially contaminated land due to the demolition of land-based infrastructure will be controlled using standard site management practices and the risk of such run-off is thus considered to be low risk with the appropriate embedded mitigation measures in place. The embedded pollution control measures set out within the EMP would be implemented and adhered to throughout all demolition activities on land. Considering the distance from

Receptor	Summary of Predicted Effect	Receptor importance	Magnitude of Change	Effect and Significance	Summary of Rationale
					land-based decommissioning works to the intertidal habitats, their intermittent nature, and the embedded measures for managing site drainage and runoff, effects are considered to be not significant.
Subtidal habitats / species	Decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase, resulting in the loss of habitat and physical disturbance and degradation in habitat quality	Very low to Medium	Very low	Negligible (not significant)	Habitat loss resulting from the removal of structures at seabed level or below the seabed, and minor seabed preparations will not have an effect on *Sabellaria* reefs. The sandy and muddy biotopes within the Works Area are common and widespread, occurring in levels comparable to those of the surrounding area, and thus of negligible importance with respect to this assessment. The limited scale and duration of the Proposed Works will not result in significant habitat damage or loss. In addition, any seabed disturbance will be localised and suspended sediments readily dispersed by the high-water flow in the environment.
	Discharges from vessels during decommissioning and removal of marine infrastructure during the Preparations for Quiescence phase, resulting in the loss of habitat and physical	Very low to Medium	Very low	Negligible (not significant)	The dismantling and decommissioning of marine structures will be completed utilising long reach excavators working from anchored pontoons. Structures will be demolished to seabed level and the debris loaded from the sea bed on to a barge for disposal. The

Receptor	Summary of Predicted Effect	Receptor importance	Magnitude of Change	Effect and Significance	Summary of Rationale
	disturbance and degradation in habitat quality				section of the caisson protruding above the seabed will be broken out by the excavators and the debris allowed to fall into the shaft of the Intake Tunnel. Divers will be deployed to inspect the work face before and after the works. All vessels and plant involved in the Proposed Works would be required to adhere to standard pollution control measures, such as those established under the International Convention for the Prevention of Pollution from Ships (MARPOL)[1] and the Ballast Water.
	Demolition works and ground remediation during the Preparations for Quiescence phase and Final Site Clearance phase resulting in the loss of habitat and physical disturbance and degradation in habitat quality	Very low to Medium	Very low	Negligible (not significant)	The demolition of land-based infrastructure has limited scope to affect the marine environment, largely confined to the potential impacts of site drainage/runoff and possible non-routine events. All land-based run-off will be treated using silt traps and oil separators and demolition activities managed using standard good site practice (e.g. appropriate bunds around fuel storage, etc.).

1 International Convention for the Prevention of Pollution from Ships (MARPOL). (online) Available at: https://www.imo.org/en/about/Conventions/Pages/International-Convention-for-the-Prevention-of-Pollution-from-Ships-(MARPOL).aspx [Accessed August 2024)

Receptor	Summary of Predicted Effect	Receptor importance	Magnitude of Change	Effect and Significance	Summary of Rationale
Fish	Decommissioning and removal of marine infrastructure through conventional methods during Preparations for Quiescence phase resulting in effects of underwater noise on hearing sensitivity and behaviour	Medium	Low	Minor (not significant)	Underwater noise and vibration from excavators, pulverisers and breakers operating on the anchored pontoons may cause temporary behavioural disturbance and displacement of fish in the Study Area. However, it is not anticipated at this stage that noise transmitted underwater from plant on the pontoons will be of sufficient magnitude to cause appreciable impairment to fish with the appropriate noise management measures in place.
	Onshore demolition works and ground remediation during Preparations for Quiescence phase and Final Site Clearance phase resulting in increased sedimentation	Medium	Very low	Negligible (not significant)	Demolition and other decommissioning activities in the terrestrial environment will be controlled through embedded mitigation measures thereby reducing the risk of runoff occurring. As previously described, where runoff and site drainage does occur, this will affect a very localised area (tens of metres) and is not considered to have any implications for fish.
Marine mammals	Decommissioning and removal of marine infrastructure through conventional methods during the Preparations for Quiescence Phase resulting in effects of underwater	Medium	Low	Minor (not significant)	Marine mammals are highly mobile species and may travel great distances searching for feeding grounds or for breeding. The Severn Estuary is naturally a highly turbid body of water due to its physical shape, tidal regime and flow rates. Therefore, any marine mammals that

Receptor	Summary of Predicted Effect	Receptor importance	Magnitude of Change	Effect and Significance	Summary of Rationale
	noise on hearing sensitivity and behaviour				may occasionally enter the Works Area will be habituated to the high levels of sediment within the water column. The temporary localised increase in turbidity levels from the Proposed Works will therefore not have a significant impact.
	Onshore demolition works and ground remediation during Preparations for Quiescence phase and Final Site Clearance phase	Medium	Very low	Negligible (not significant)	Demolition and other decommissioning activities in the terrestrial environment will be controlled through embedded mitigation measures thereby reducing the risk of runoff occurring. As previously described, where runoff and site drainage does occur, this will affect a very localised area (tens of metres) and is not considered to have any implications for marine mammals.

Table 22-5 - Summary of residual effects for coastal management and water quality

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
Wave and current regime All phases	Removal of the HPB intake structure would be expected to reduce shelter of the coastline immediately inshore of the structure, which may therefore be exposed to	N/a	Very low	N/a	Due to the minimal footprint of the intake structure (35 m diameter in water depth of 1 m below CD) and the small proportion of the cross-section of the Bristol Channel (20 km wide and up to 25 m deep below CD) occupied by this structure, changes to the overall hydrodynamic regime in the vicinity will be very low in magnitude and

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
	larger waves when the wind is from the north-west. Similarly, the intake structure provides some restrictions to tidal flows which will be removed.				effects of increased wave impingement on the shore and changes in currents will be highly localised.
Sediment transport All phases	The absence of the intake infrastructure could change the sediment transport regime in the surrounded area.	N/a	Very low	N/a	As changes to the tidal current and wave regime will be highly localised and very small, changes to the overall sediment transport regime in the Bristol Channel are predicted to be very low.
Shoreline processes All phases	Removal of the intake infrastructure could cause changes in levels of erosion along the shoreline.	N/a	Very low	N/a	Due to the minimal footprint of marine infrastructure associated with HPB, and the fact that the sea defences are already in place in the form of a sea wall and are subject to an agreed management regime under the SMP2. It is considered that localised increases changes in current velocity and increase in wave heights along this limited section of coast are therefore not expected to result in any measurable changes in coastal erosion or sediment deposition.
North Devon and Somerset Shoreline Management Plan Review (SMP2) Hartland Point to Anchor Head (2010) All phases	Any works that would compromise existing flood defence levels or lead to an increase in coastal erosion could result in a need to change actions in relation to the SMP.	Medium	Very low	Negligible (Not significant)	None of the works proposed will involve a need to dismantle or compromise or lower the crest level of any existing coastal defences. Also, the changes in hydrodynamic regime will be minimal and highly localised within a section of coast already defended from erosion by a seawall. Therefore, there will be no significant effects on coastal management required to comply with the SMP2 or any need to revise the plan due to the Proposed Works.

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
Water quality Preparations for Quiescence	Drainage of water from the existing outfall could affect the receiving water.	Low	Very low	Negligible (Not significant)	The water to be drained down will comprise only water currently being discharged from the outfall so there will be no effect.
Water quality Preparations for Quiescence	Coastal water quality could be affected by suspended sediment mobilised during marine works, with potential indirect adverse effects on marine biodiversity (addressed in **Chapter 9: Marine Biodiversity** and the **HRA Appraisal**).	Low	Very low	Negligible (Not significant)	To avoid mobilisation of contaminated sediments and consequent effects on water quality, the intake structure will be removed to seabed level and tunnels left in situ below the seabed. The HPB intake structure and AEDL will be dismantled without use of explosives. The new AEDL will be installed and removed within the existing outfall channel which contains little sediment due to the scouring effects of discharges. Any effects on water quality due to minor unavoidable sediment mobilisation will be temporary and minimal.
Water quality All phases	Coastal water quality could be affected by spillages of fuel, oil or other chemicals from vessels involved in the Works or on the Site.	Low	Very low	Negligible (Not significant)	The EMP will set out strict procedures requiring appropriate storage, bunding, use and management of harmful substances to minimise risks of spills of spills of fuel, oils or chemicals. Inventories of harmful materials present at any one time in the marine environment will be minimised, consistent with operational safety requirements. A spill response plan will be included in the EMP and implemented immediately in the event of a spillage on vessels or plant involved in the marine Works or on the Site.
Water quality All phases	Water quality could be affected by sediment laden or contaminated runoff (including radiological contaminants being released	Low	Very low	Negligible (Not significant)	**Chapter 11: Surface Water and Flood Risk** has established that there will be no significant change in contaminant levels (including radiological components) in surface water runoff from the Site that could lead to an adverse effect on the relevant coastal water bodies.

Receptor/ phase(s)	Summary of predicted effect	Importance /value of receptor	Magnitude of change	Significance	Summary of rationale
	in surface water runoff from the Site				
Water quality All phases	Water quality could be affected by permitted discharges via the AEDL	Low	Very low	Negligible (Not significant)	Operational discharges via the AEDL are likely to be covered under existing permits, which will continue to be subject to ongoing regulation by the Environment Agency, ensuring no significant adverse environmental effect on the coastal water bodies.
Water quality All phases	Changes in discharge of treated sewage could affect EQS compliance at Bathing Waters	High	Very low	Minor (Not significant)	Discharge location is expected to be further to seaward and sewage flows will be reduced compared with the current situation. Therefore, the Proposed Works will not compromise maintenance of the existing good or sufficient status at relevant Bathing Waters.

Table 22-6 - Summary of residual effects for surface water and flood risk

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
The Rhynes	Sediment laden runoff being released from areas of ground disturbance to inland watercourses during site demolition and ground reinstatement.	Very Low	Low	Negligible (Not Significant)	Good practice in the EMP will ensure no surface water flow paths are created leaving the Works Area and so there will be no runoff entering the Rhynes.
	Effects on the water quality of inland watercourses	Very Low	Low	Negligible (Not Significant)	Good practice in the EMP reduces the likelihood and severity of spillages and

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
	associated with accidental spillages of fuels and oils.				enables appropriate containment of any spillages that do occur.
On-site infrastructure	Change in surface water flood risk due to changes in hardstanding and alteration to existing pathways/surface water flood risk from proposed groundworks.	Safe store - High All other infrastructure - Medium	Very Low (positive) Very Low	Minor (Not Significant) Minor (Not Significant)	The potential OWPF and DWPF, and Safestore will be safe from external flooding due to the embedded measures.
	Increase in tidal flood risk.	Safe store - High All other infrastructure - Medium	Very Low	Minor (Not Significant) Negligible (Not Significant)	In a current day scenario, the majority of the Works Area is not at risk from tidal flooding. The Proposed Works are not expected to change the flood risk apart from a slight increase in floodplain from Safestore demolition at the end of the final site clearance phase, when there will be no on-site receptors.
On-site staff	Change in surface water flood risk due to changes in hardstanding and alteration to existing pathways/surface water flood risk from proposed groundworks.	High	Very Low	Minor (Not Significant)	Following good practice outlined in the EMP (adhering to a flood warning, response and evacuation plan) will ensure no on-site staff will be at risk from any increase in surface water flooding.
	Change in tidal flood risk.	High	Very Low	Minor (Not Significant)	Following good practice outlined in the EMP will ensure that no on-site staff will be at risk from an increase in tidal flooding.

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
Off-site people, property and infrastructure	Change in surface water or tidal flood risk	People - High Property and infrastructure – Low - Medium	Very Low	Minor (Not Significant) Negligible (Not Significant)	The changes to off-site surface water and tidal flood risk as a result of the Proposed Works are expected to be negligible.

Table 22-7 - Summary of residual effects for soils, geology and hydrogeology

Receptors potentially affected[2]	Phase(s)	Summary of Predicted Effect	Magnitude of Change in the level of risk to receptors as a result of the Proposed Works	Significance	Summary of Rationale
R1 to R10	Preparations for Quiescence, also Quiescence and Final Site Clearance	A1: Land quality ground investigations (e.g. excavations/trial pits, groundwater monitoring well construction / decommissioning)	Negligible	Not Significant	Embedded measures that will inform the design and implementation of ground investigations to avoid the release of contaminants due to ground investigation works include the following measures set out in **Table 12.7** in **Chapter: 12 Soils, Geology and Hydrogeology** 12.2, 12.3, 12.5, 12.6, 12.7, 12.8, 12.9, 12.11, 12.15 and 12.16.
R1 to R10	Preparations for	A2: Leaks/spills of fuels and oils	Negligible	Not Significant	Embedded measures to reduce the likelihood of a release

[2] Receptors are defined as follows (see also **Chapter 12 Soils, Geology and Hydrogeology, paragraph 12.9.4**):
R1: human health (current and future site users, decommissioning workforce and adjacent land users),
R2: decommissioning workforce, and adjacent land users – includes public paths, fields, adjacent nuclear site users at HPA).

Receptors potentially affected[2]	Phase(s)	Summary of Predicted Effect	Magnitude of Change in the level of risk to receptors as a result of the Proposed Works	Significance	Summary of Rationale
	Quiescence, also Quiescence and Final Site Clearance	from plant and storage tanks during construction work			occurring and to monitor for any changes in groundwater or surface water quality during the Proposed Works include the following measures set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology** 12.1, 12.2, 12.5, 12.6, 12.7 and 12.8.
R1 to R10	Preparations for Quiescence, Final Site Clearance	A3: Removal of foundations/ floor slabs, road surfaces	Negligible	Not Significant	Embedded measures that will inform risk assessments for potential new risks or changes to the level of risk to receptors due to changes to existing surface cover include the following measures set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology** 12.1, 12.2, 12.3, and 12.11.
R1 to R10	Preparations for Quiescence,	A4: Backfilling subsurface voids and reuse of site-	Negligible	Not Significant	Embedded measures to ensure adequate assessment and verification of the suitability for use

R3: Groundwater in made ground and superficial deposits (secondary [undifferentiated] aquifer in the beach and tidal flat deposits to the east and south,
R4: Groundwater in the Lower Lias (bedrock secondary A aquifer),
R5: Surface water drainage ditches (rhynes), the nearest located approximately 50m southeast, running north to Bridgwater Bay, and surface water in ponds near the sewage works,
R6: Coastal surface water in Bridgwater Bay,
R7: Property: livestock and crops in fields east and south of the Site
R8: wild animals subject to commercial fishing in Bridgwater Bay and the Severn Estuary (fish and crustaceans), wild animals onshore (game)
R9: on and offsite current and future built environment
R10: Ecologically sensitive sites e.g. Bridgwater Bay SSSI and National Nature Reserve (NNR), Severn Estuary SPA, SAC and Ramsar site
R11: Sensitive area with hydrogeological connection to the Works Area

Receptors potentially affected[2]	Phase(s)	Summary of Predicted Effect	Magnitude of Change in the level of risk to receptors as a result of the Proposed Works	Significance	Summary of Rationale
	Final Site Clearance	derived materials, and residual contamination in subsurface structures			of materials used for backfilling, taking into consideration potential residual contamination within structures, include the following measures set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology** 12.1, 12.2, 12.3, 12.4, 12.10, and 12.12.
R1 to R10	Preparations for Quiescence, also Quiescence and Final Site Clearance	A5: Laydown and storage, including soil and material stockpiles	Negligible	Not Significant	Embedded measures that will contribute to the careful management of material in stockpiles and lower risks to the environment include the following measures set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology**: 12.1, 12.2, 12.3, 12.10, 12.11, and 12.12.
R1 to R10	Preparations for Quiescence, Final Site Clearance	A6: Removal of drains (active and non-active drainage)	Negligible	Not Significant	Embedded measures to lower the risk of contaminants present in drainage systems causing an impact to environmental receptors during changes to the existing drainage systems include the following measures set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology** 12.1, 12.2, 12.3, and 12.11.
R1 to R10, R11	Preparations for Quiescence, Final Site Clearance	A7: Pumping and dewatering schemes	Negligible	Not Significant	Embedded measures to minimise the environmental risks associated with dewatering include the following measures set out in **Table 12.7** in **Chapter 12: Soils,**

Receptors potentially affected[2]	Phase(s)	Summary of Predicted Effect	Magnitude of Change in the level of risk to receptors as a result of the Proposed Works	Significance	Summary of Rationale
					Geology and Hydrogeology 12.1, 12.2, 12.3, 12.11, and 12.16.
R1 to R10	Preparations for Quiescence, also Quiescence and Final Site Clearance	A8: Core slab drilling	Negligible	Not Significant	Embedded measures to ensure that adequate planning and management of drilling works is undertaken to limit the potential for pollution incidents measures as set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology** 12.1, 12.2, 12.3, 12.5, 12.6, 12.7 and 12.8.
R1 to R10	Preparations for Quiescence, also Quiescence and Final Site Clearance	A9: Construction of sub-surface structures	Negligible	Not Significant	Embedded measures that will avoid or lower the potential for the Proposed Works to result in the mobilisation of pre-existing contaminants as set out in **Table 12.7** in **Chapter 12: Soils, Geology and Hydrogeology** 12.1, 12.2, 12.3, 12.5, 12.6, and 12.12.

Table 22-8 - Summary of residual effects for Historic environment

Receptor	Impact	Sensitivity / Importance / Value of Receptor	Phase	Magnitude of Change	Significance	Summary of Rationale
HPB buildings	Demolition of ancillary buildings, Safestore construction to reactor and eventual demolition of same through Final Site Clearance.	Low	Preparations for Quiescence	Low	Not Significant (Minor adverse)	Complete removal of a facility with a limited historic interest for the history of UK energy generation and associated architecture, with appropriate mitigation through building recording.
			Quiescence	None	No Effect	
			Final Site Clearance	High	Not Significant (Minor adverse)	
Scheduled round cairn known as Pixie's Mound (NHLE 1006226; 268 m south-west of the Works Area)	Change of visual element of reactor in views through Safestore construction and eventual removal through Final Site Clearance.	High	Preparations for Quiescence	Negligible	Not Significant (Minor Adverse)	Minimal change to the experience of the receptor through appreciation of its setting; the general utilitarian appearance/sense of the reactor structure will remain unchanged until removal.
			Quiescence	Negligible	Not Significant (Minor Adverse)	
			Final Site Clearance	Negligible	Not Significant (Minor Beneficial)	
Grade II listed Zine Farmhouse (NHLE 1175753; 1.30 km south-east of the Works Area)	Change of visual element of reactor in views through Safestore construction and eventual removal	High-Medium	Preparations for Quiescence	Negligible	Not Significant (Minor Adverse)	Negligible change to the experience of the receptor through appreciation of its setting; the general utilitarian appearance/sense of the reactor structure will remain unchanged until removal.
			Quiescence	Negligible	Not Significant	

Receptor	Impact	Sensitivity / Importance / Value of Receptor	Phase	Magnitude of Change	Significance	Summary of Rationale
	through Final Site Clearance.				(Minor Adverse)	
			Final Site Clearance	Negligible	Not Significant (Minor Beneficial)	
Stolford Group. Grade II listed Sea View, Stolford Farmhouse, and D'Arches (NHLE 1057379, 1057378, 1308209); 1.55 km east of the Works Area).	Change of visual element of reactor in views through Safestore construction and eventual removal through Final Site Clearance.	High-Medium	Preparations for Quiescence	Negligible	Not Significant (Minor Adverse)	Minimal change to the experience of the receptor through appreciation of its setting; the general utilitarian appearance/sense of the reactor structure will remain unchanged until removal.

Table 22-9 - Summary of residual effects for landscape and visual[3]

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Direct effects on landscape character – See Chapter 14, Section 14.10							
Quantock Vale - Eastern Lowlands Sub-Area	Preparation for Quiescence phase	Low (within the Works Area)	High (within the Works Area)	Moderate and Not Significant within the Works Area	Adverse	Moderate and Not Significant within the Works Area	**Major** to **Moderate** and Significant (HPC construction) **Major** (Year 1) to **Moderate** (Year 15) and Significant (coastal area around Lilstock) to Minor and Not Significant within the remainder of the LCA Sub-Area (HPC operation)
		Medium within the wider LCA Sub-Area	Low reducing to Very Low within the wider LCA Sub-Area to Zero (areas outside of the ZTV)	Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV)		Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV)	
	Quiescence phase	Low (within the Works Area) Medium within the	Very Low to Zero (areas outside of the ZTV)	Minor and Not Significant to None (areas outside of the ZTV)	Neutral	Minor and Not Significant to None (areas outside of the ZTV)	**Moderate** and Significant (coastal area around Lilstock) to Minor and Not Significant within the remainder of

[3] [3] Due to the level of information associated with summary of rationale , these are not duplicated here; references are provided to the ES chapter or relevant LVIA Appendix.

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
		wider LCA Sub-Area					the LCA Sub-Area (HPC operation)
	Final Site Clearance phase	Low (within the Works Area)	High (within the Works Area)	Moderate and Not Significant within the Works Area	Adverse	N/A	N/A
		Medium within the wider LCA Sub-Area	During Final Site Clearance: Low reducing to Very Low within the wider LCA Sub-Area to Zero (areas outside of the ZTV).	During Final Site Clearance: Moderate/Minor to Minor and Not Significant within the wider LCA Sub-Area to None (areas outside of the ZTV).	Adverse		
			Post removal of all buildings: Medium within approximately 1.5 km to Low to Very Low to Zero (areas outside of the ZTV).	Post removal of all buildings: Moderate within approximately 1.5 km to Moderate/Minor to Minor and Not Significant to None (areas outside of the ZTV).	Beneficial		

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Quantock Vale - The Coast (St Audries to Hinkley Point) Sub-Area	Preparation for Quiescence phase	High (west of HPC)	Low/Very Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None (west of HPC)	Adverse to Neutral	Moderate/Minor and Not Significant to None (west of HPC)	**Major** and Significant (HPC construction) **Moderate** and Significant (HPC operation)
		Medium (north of HPC/ HPA/HPB)	Medium	Moderate and Not Significant (north of HPC/ HPA/HPB)	Adverse	Moderate and Not Significant (north of HPC/ HPA/HPB)	
	Quiescence phase	High (west of HPC)	Very Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None (west of HPC)	Neutral	Moderate/Minor and Not Significant to None (west of HPC)	**Moderate** and Significant (HPC operation)
		Medium (to north of HPC/ HPA/HPB)	Very Low	Minor and Not Significant (north of HPC/ HPA/HPB)	Neutral	Minor and Not Significant (north of HPC/ HPA/HPB)	
	Final Site Clearance phase	High (west of HPC)	Very Low to Zero (during Final Site Clearance and post removal of all buildings)	Moderate/Minor and Not Significant to None (west of HPC)	Adverse to Neutral	N/A	N/A
		Medium (to north of	Medium (during Final Site Clearance and	Moderate and Not Significant	Adverse (during Final	N/A	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
		HPC/ HPA/HPB)	post removal of all buildings)	(north of HPC/ HPA/HPB)	Site Clearance) Beneficial (post removal of all buildings)		
Quantock Vale - Wick Moor and Coast Sub-Area	Preparation for Quiescence phase	Medium	Low to Very Low at the end of the phase	Moderate/Minor to Minor and Not Significant	Adverse	Moderate/Minor to Minor and Not Significant	**Major** and Significant (HPC construction)
	Quiescence phase	Medium	Very Low	Minor and Not Significant	Neutral Beneficial within coastal areas due to the removal of built form	Minor and Not Significant	Moderate/Minor and Not Significant (HPA Final Site Clearance phase)
	Final Site Clearance phase	Medium	Low (during Final Site Clearance)	Moderate/Minor and Not Significant	Adverse	N/A	N/A
			Medium (post removal of all buildings)	Moderate and Not Significant	Beneficial		
Indirect effects on landscape character - See Chapter 14, Section 14.10							

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Quantock Vale - Wall Common and Coast Sub-Area	Preparation for Quiescence phase	Medium	Low to Very Low at the end of the phase to Zero (areas outside of the ZTV).	Moderate/Minor to Minor and Not Significant to None	Adverse	Moderate/Minor to Minor and Not Significant	Moderate/Minor and Not Significant (HPA Preparations for Quiescence phase)
	Quiescence phase	Medium	Very Low to Zero (areas outside of the ZTV).	Minor and Not Significant to None	Neutral	Minor and Not Significant	Moderate/Minor and Not Significant (HPA Final Site Clearance phase)
	Final Site Clearance phase	Medium	Low to Zero (areas outside of the ZTV).	Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Visual effects on views from settlements - See Chapter 14, Section 14.11 and Appendix 14D, Table 14D-1							
Stolford	Preparation for Quiescence phase	High	Medium/Low (localised areas on western edge)	**Moderate** and Significant (localised areas on western edge)	Adverse	**Moderate** and Significant (localised areas on western edge)	**Major/Moderate** and Significant (HPC construction)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			Low or Very Low (majority of the settlement)	Moderate to Moderate/Minor and Not Significant (majority of the settlement)	Adverse	Moderate to Moderate/Minor and Not Significant (majority of the settlement)	**Moderate** and Significant (HPC operation)
	Quiescence phase	High	Low (localised areas on western edge)	Moderate and Not Significant (localised areas on western edge)	Beneficial	Moderate and Not Significant (localised areas on western edge)	**Moderate** and Significant (HPC operation)
			Very Low (majority of the settlement)	Moderate/Minor and Not Significant (majority of the settlement)	Neutral	Moderate/Minor and Not Significant (majority of the settlement)	
	Final Site Clearance phase	High	Medium/Low (localised areas on western edge)	**Moderate** and Significant (localised areas on western edge)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Low to Very Low (majority of the settlement)	Moderate to Moderate/Minor and Not Significant (majority of the settlement)			

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Wick	Preparation for Quiescence phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Adverse	Moderate to Moderate/Minor and Not Significant	Moderate and Not Significant (HPC and HPA)
	Quiescence phase	High	Very Low	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	Moderate and Not Significant (HPC and HPA)
	Final Site Clearance phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Stogursey	Preparation for Quiescence phase	High	Low/Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Adverse	Moderate/Minor and Not Significant (northern edge of the settlement)	Moderate and Not Significant (HPC)
			Zero (majority of the settlement)	None (majority of the settlement)	Neutral	None (majority of the settlement)	
		High	Very Low (northern edge	Moderate/Minor and Not	Neutral	Moderate/Minor and Not Significant	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase		of the settlement)	Significant (northern edge of the settlement)		(northern edge of the settlement)	Moderate and Not Significant (HPC)
			Zero (majority of the settlement)	None (majority of the settlement)		None (majority of the settlement)	
	Final Site Clearance phase	High	Very Low (northern edge of the settlement)	Moderate/Minor and Not Significant (northern edge of the settlement)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Zero (majority of the settlement)	None (majority of the settlement)	Neutral		
Visual effects on views from recreational routes - See Chapter 14, Section 14.11 and Appendix 14D, Table 14D-2							
King Charles III England Coast Path and West Somerset Coast Path	Preparation for Quiescence phase	High	Low (east of Stolford)	Moderate and Not Significant (east of Stolford)	Adverse	Moderate and Not Significant (east of Stolford)	**Major** and Significant (HPC)
			Medium/Low to Medium (Stolford to the	**Moderate** to **Major/Moderate** and Significant		**Moderate** to **Major/Moderate** and Significant (Stolford to	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
(westbound walkers)			western edge of the Works Area (2.5 km section))	(Stolford to the western edge of the Works Area (2.5km section))		the western edge of the Works Area (2.5km section))	
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral	None (west of the Works Area)	
	Quiescence phase	High	Very Low (east of Stolford)	Moderate/Minor and Not Significant	Neutral	Moderate/Minor and Not Significant	**Major** and Significant (HPC)
			Low (Stolford to the western edge of the Works Area (2.5 km section))	Moderate and Not Significant	Beneficial	Moderate and Not Significant	
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral	None (west of the Works Area)	
	Final Site Clearance phase	High	Low (east of Stolford)	Moderate and Not Significant (east of Stolford)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			Medium/Low to Medium during Final Site Clearance increasing to Medium to High post removal of all buildings (Stolford to the western edge of the Works Area (2.5 km section))	**Moderate** to **Major/Moderate** and Significant during Final Site Clearance **Major/Moderate to Major** and Significant post removal of all buildings (Stolford to the western edge of the Works Area (2.5km section))	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)		
			Zero (west of the Works Area)	None (west of the Works Area)	Neutral		
King Charles III England Coast Path and West Somerset Coast Path (eastbound walkers)	Preparation for Quiescence phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Adverse/ Neutral	Moderate/Minor and Not Significant to None (west of HPA)	**Major** and Significant (HPC)
			Medium (north of HPA/HPB (750 m section))	**Major/Moderate** and Significant	Adverse	**Major/Moderate** and Significant	
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral	None (east of the Works Area)	

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Neutral	Moderate/Minor and Not Significant to None (west of HPA)	**Major** and Significant (HPC)
			Low (north of HPA/HPB (750 m section))	Moderate and Not Significant (north of HPA/HPB (750 m section))	Beneficial	Moderate and Not Significant (north of HPA/HPB (750 m section))	
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral	None (east of the Works Area)	
	Final Site Clearance phase	High	Very Low to Zero (west of HPA)	Moderate/Minor and Not Significant to None (west of HPA)	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
			Medium during Final Site Clearance and Medium to High post removal of all buildings	**Major/Moderate** and Significant during Final Site Clearance **Major/Moderate** to **Major** and	Adverse (during Final Site Clearance) Beneficial (post removal		

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			(north of HPA/HPB (750 m section))	Significant post removal of all buildings	of all buildings)		
			Zero (east of the Works Area)	None (east of the Works Area)	Neutral		
King Charles III England Coast Path and West Somerset Coast Path (inland diversion)	Preparation for Quiescence phase	High	Low to Zero	Moderate and Not Significant to None	Adverse	Moderate and Not Significant to None	**Major** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major** and Significant (HPC)
	Final Site Clearance phase	High	Low to Zero	Moderate and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Castles & Coast Way	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major** to **Major/Moderate** and Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major/Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network A (west of HPC and Shurton Lane)	Preparation for Quiescence phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate/Minor and Not Significant to None	**Major** to **Major/Moderate** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Major/Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
					of all buildings)		
Local PRoW network B (Stogursey to HPC)	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major** to **Moderate** and Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network C (Farrington Hill)	Preparation for Quiescence phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Beneficial/ Neutral	Moderate/Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Local PRoW network D (Wick to Stolford)	Preparation for Quiescence phase	High	Medium/Low to Medium (local PRoWs 23/95, 23/107 and 23/101)	**Moderate** to **Major/Moderate** and Significant (local PRoWs 23/95, 23/107 and 23/101)	Adverse	**Moderate** and Significant (local PRoWs 23/95, 23/107 and 23/101)	**Major** to **Major/Moderate** to **Moderate** and Significant (HPC)
			Low (remainder of the network)	Moderate and Not Significant (remainder of the network)		Moderate and Not Significant (remainder of the network)	
	Quiescence phase	High	Low (local PRoWs 23/95, 23/107 and 23/101)	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101)	Beneficial	Moderate and Not Significant (local PRoWs 23/95, 23/107 and 23/101)	**Major/Moderate** to **Moderate** and Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
			Very Low (remainder of the network)	Moderate/Minor and Not Significant (remainder of the network)	Neutral	Moderate/Minor and Not Significant (remainder of the network)	
	Final Site Clearance phase	High	Medium/Low to Medium during Final Site Clearance Medium post removal of all buildings (local PRoWs 23/95, 23/107 and 23/101)	**Moderate** to **Major/Moderate** and Significant during Final Site Clearance **Major/Moderate** and Significant post removal of all buildings (local PRoWs 23/95, 23/107 and 23/101)	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
			Low (remainder of the network)	Moderate and Not Significant (remainder of the network)			
Local PRoW network E (Stolford to Stockland Bristol)	Preparation for Quiescence phase	High	Low to Low/Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and Significant (HPC)

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Low to Low/Very Low to Zero	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral (during Final Site Clearance) Beneficial/ Neutral (post removal of all buildings)	N/A	N/A
Local PRoW network F (Hillside Farm to Lower Cock Farm)	Preparation for Quiescence phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate/Minor and Not Significant to None	Moderate and Not Significant (HPC)
	Quiescence phase	High	Very Low to Zero	Moderate/Minor and Not Significant to None	Neutral	Moderate/Minor and Not Significant to None	Moderate and Not Significant (HPC)
	Final Site Clearance phase	High	Low/Very Low to Zero	Moderate/Minor and Not Significant to None	Adverse/ Neutral (during Final Site Clearance)	N/A	N/A

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
					Beneficial/ Neutral (post removal of all buildings)		
Visual effects on views from recreational destinations - See Chapter 14, Section 14.11 and Appendix 14D, Table 14-3							
Open Access Land: Man Moor, North Moor, Wick Moor, Great Hooks and Little Hooks, Ham, Sharpham, North Ham, Goose Marsh, Redham	Preparation for Quiescence phase	High	Medium to Medium/Low to Low	**Major/Moderate** to **Moderate** and Significant to Moderate and Not Significant	Adverse	**Major/Moderate** to **Moderate** and Significant to Moderate and Not Significant	**Major** to **Major/Moderate** to **Moderate** and Significant (HPC)
	Quiescence phase	High	Low to Very Low	Moderate to Moderate/Minor and Not Significant	Beneficial/ Neutral	Moderate to Moderate/Minor and Not Significant	**Major/Moderate** to **Moderate** and Significant (HPC)
	Final Site Clearance phase	High	Medium to Medium/Low to Low	**Major/Moderate** to **Moderate** and Significant to Moderate and Not Significant	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A
Visual effects on views from transport routes - See Chapter 14, Section 14.11 and Appendix 14D, Table 13D-4							

Receptor	Phase	Sensitivity	Magnitude of Change	Level of effect	Type of effect	Cumulative Effects (Additional)	Cumulative Effects (Combined)
Wick Moor Drove	Preparation for Quiescence phase	Medium	Medium/Low to Low to Low/Very Low to None	Moderate to Moderate/Minor and Not Significant to None	Adverse/ Neutral	Moderate to Moderate/Minor and Not Significant to None	**Major/Moderate** to **Moderate** and Significant (HPC)
	Quiescence phase	Medium	Very Low to Zero	Minor and Not Significant to None	Neutral	Minor and Not Significant to None	**Moderate** and Significant (HPC)
	Final Site Clearance phase	Medium	Medium/Low to Low to Low/Very Low to None	Moderate to Moderate/Minor and Not Significant to None	Adverse (during Final Site Clearance) Beneficial (post removal of all buildings)	N/A	N/A

Table 22-10 - Summary of residual effects for noise and vibration

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
All receptors listed in Table 15-14 of **Chapter 15: Noise and Vibration.** .	Noise effects due to noise arising from activities in the Works Area	High (Residential) Low (Public right of way)	Negligible (Residential) Medium (Public right of way)	Minor (not significant)	Noise levels during peak years of activity are predicted not to exceed the BS 5228-113 thresholds of significance
All receptors listed in Table 15-14 of **Chapter 15: Noise and Vibration**	Noise effects due to increased road noise from vehicle movements generated by the Proposed Works.	High (Residential) Low (Public right of way)	Negligible	Minor (not significant)	Assessment indicates no significant increases of road traffic noise due to the Proposed Works.
All receptors listed in Table 15-14 of **Chapter 15: Noise and Vibration**	Cumulative noise effects due to noise arising from activities in the Works Area and noise emissions from the construction and operation of other developments.	High (Residential) Low (Public right of way)	Negligible (Residential) Medium (Public right of way)	Minor (not significant)	Review of available information on other proposed/ consented schemes indicates that none are likely to present a significant risk of giving rise to noise emissions with the potential to cause cumulative noise effects.
All receptors listed in Table 15-14 of **Chapter 15: Noise and Vibration**	Cumulative noise effects due to increased road noise from vehicle movements generated by the Proposed Works and other	High (Residential) Low (Public right of way)	Negligible	Minor (not significant)	Assessment indicates no significant increases of road traffic noise due to the Proposed Works. As such, any significant increases would be

	proposed/ consented developments.				dominated by the other proposed/ consented developments.

Table 22-11 - Summary of residual effects for traffic and transport

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
A39 Quantock Rock					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible (Not significant)	The Proposed Works traffic is expected to increase total traffic on the A39 Quantock Road by 0.1% and HGV flows by 0.3% during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Additionally, transport investments in Sedgemoor aimed at enhancing the operational capacity of the highways will alleviate existing capacity constraints, ensuring minimal impact on driver delays due to the additional traffic associated with HPB. , Preparations for Quiescence phase
	Road Safety	Rule 2 / Medium	Negligible	Negligible (Not significant)	The cluster analysis has not identified any underlying highway safety identified on this link. As such there are no existing highway safety issues that could be exacerbated by the vehicle movements associated with the proposed decommissioning work.
A39 Homberg Way					

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
	Driver Delay	Rule 2 / Medium	Negligible	Negligible (Not significant)	~~-n~~ The Proposed Works traffic is projected to increase total traffic on the A39 Homberg Way by 0.1% and HGV flows by 0.2% during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Furthermore, transport investments in Sedgemoor aimed at enhancing highway operational capacity will address existing constraints, ensuring that the additional traffic associated with HPB will have minimal impact on driver delays.
	Road Safety	Rule 2 / Medium	Negligible	Negligible (Not significant)	The cluster analysis has not identified any underlying highway safety identified on this link. As such there are no existing highway safety issues that could be exacerbated by the vehicle movements associated with the proposed decommissioning work.
A38 Bristol Road					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible (Not significant)	The Proposed Works traffic is anticipated to increase total traffic on the A39 Bristol Road by 0.1%, with a 0.1% rise in HGV flows during the peak periods in both 2030 and 2034, leading to a negligible impact on the route. Additionally, planned transport investments in Sedgemoor to enhance highway operational capacity will

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					resolve existing constraints, ensuring that the additional traffic associated with HPB will have minimal impact on driver delays..
	Road safety	Rule 2 / Medium	Negligible	Negligible (Not significant)	From the cluster analysis, no specific accident patterns have been identified on this link, and most accidents are attributed to driver behaviour. Therefore, there are no existing highway safety issues that could be exacerbated by the construction vehicle movements associated with the proposed decommissioning work.
A38 Taunton Road					
	Driver Delay	Rule 2 / Medium	Negligible	Negligible (Not significant)	The ~~in~~ Proposed Works traffic is expected to increase total traffic on the A38 Taunton Road by only 0.1%, with a 0.1% rise in HGV flows during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route. Moreover, planned transport investments in Sedgemoor to improve highway operational capacity will eliminate existing constraints, ensuring minimal impact on driver delays due to the additional traffic associated with HPB.
	Road safety	Rule 2 / Medium	Negligible	Negligible (Not significant)	Based on cluster analysis, there is no underlying highway safety issues identified along this link, collisions are attributed to driver error / behaviour.

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					Therefore, the proposed decommissioning traffic is not expected to have a negative impact upon the link.
A38					
	Driver Delay	Rule 1 / Low	Negligible	Negligible (Not significant)	The Proposed Works traffic is projected to increase total traffic on the A38 Bristol Road by 0.3%, with a 0.1% rise in HGV flows during the peak periods in both 2030 and 2034, having a negligible impact on the route. Additionally, planned transport investments in Sedgemoor to enhance highway operational capacity will address existing constraints, ensuring minimal impact on driver delays due to the additional traffic associated with HPB.
	Road safety	Rule 1 / Low	Negligible	Negligible (Not significant)	The cluster analysis did not identify any underlying highway safety issues. The Proposed Work is not anticipated to have a negative impact on road safety based on cluster analysis findings.
A39 between Dunball roundabout and Dunball Interchange					
	Driver Delay	Rule 1 / Low	Negligible	Negligible (Not significant)	The Proposed Works traffic is expected to increase total traffic on the A39 by 0.4%, with a 0.9% rise in HGV flows during the peak periods in both 2030 and 2034, resulting in a negligible impact on the route.

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					Furthermore, transport investments planned in Sedgemoor to improve highway operational capacity will resolve existing constraints, ensuring minimal impact on driver delays from the additional traffic associated with HPB.
	Road safety	Rule 1 / Low	Negligible	Negligible (Not significant)	Based on the cluster analysis there are no existing highway safety issues that could be exacerbated by the vehicle movements associated with the proposed decommissioning work.
A38 Huntworth Lane					
	Driver Delay	Rule 1 / Low	Negligible	Negligible (Not significant)	The Proposed Works traffic is anticipated to increase total traffic on A38 Huntworth Lane by 0.4%, with a 1.2% rise in HGV flows during peak periods in both 2030 and 2034, leading to a negligible impact on the route. Additionally, planned transport investments in Sedgemoor aimed at improving highway operational capacity will address existing constraints, ensuring that driver delays from the additional traffic associated with HPB will be minimal.
	Road safety	Rule 1 / Low	Negligible	Negligible (Not significant)	Based on cluster analysis, no underlying highway safety issues have been identified along this link; collisions

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
					have been attributed to driver error / behaviour. Therefore, the anticipated decommissioning traffic is unlikely to have a detrimental impact on the link.

Table 22-12 -Summary of residual effects for people and communities

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
Employment Market	There are effects on employment in the Three Districts areas.	Local Level - Medium Regional Level and above - Low	Local Level - Medium Regional Level and above - Low	Local Level - Adverse and Minor (Not Significant) Regional Level and above - Adverse and Minor/Negligible (Not significant)	The HPB workforce predominantly lives within the Three Districts and local employment markets will see a transition with potential growth in demand for operational staff at HPC and at the Gravity Development. Negative impacts from loss of employment will occur in 2026 and 2038 during the phase "Preparations for Quiescence", with positive impacts from new employment in 2106 for Final Site Clearance and a negative impact in 2116 at Project end.
Workers at HPB	Workers may experience variable periods of	Medium	Economic effects - Medium Health effects - Low	Adverse and Moderate (Likely Significant)	Employee household resilience and health is likely have benefited from stable

Receptor	Summary of Predicted Effect	Sensitivity / Importance / Value of Receptor	Magnitude of Change	Significance	Summary of Rationale
	unemployment and associated mental health impacts, while some may take early retirement. Workers have skills likely to be relevant to growth in the Three Districts area.				employment. Employees are skilled and experienced and may have the option of early retirement according to personal circumstances.
The local economy and businesses	Economic impacts are closely aligned with changes in employment and occur at the same times in the Project phases.	Medium	Low	Minor (Not significant)	The Three Districts market is of appreciable size and diversity and economic agents have appreciable information about schedules and have time to plan for change.
Walkers, cyclists and marine users near the Site	Onshore, residents and visitors using the King Charles III England Coast Path will pass close to the Site throughout all phases. Offshore, users of the sea area near the Site may experience effects from the marine activities of the project.	High	Very Low	Minor (not significant)	Public access along the King Charles III Coast Path near the Site will be maintained along current routes throughout all phases. Offshore activities are in small and infrequently used sea areas and can be mitigated.

Table 22-13 - Summary of residual effects for major accidents and disasters

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
Major accidents associated with the Proposed Works resulting from a fire/ explosion and caused by accidental release of substances	**Human population receptors**	Preparations for Quiescence, Final Site Clearance	Medium	Very small chance of occurring	Not significant	Whilst the majority of chemicals and fuels will be removed during the Preparations for Quiescence phase, there will be some residual inventories of hazardous substances that will be removed during Final Site Clearance phase. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to As Low As Reasonably Practicable (ALARP). These are set out in **Chapter 18, Appendix 18B.**
	Historic environment receptors	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A		The scheduled monument, Pixie's Mound is approximately 268 m south-west of the Works Area. Given the distance between the Proposed Works and the receptors and the minimal inventory of hazardous chemicals on site, it is not considered credible that a fire or explosion on site could damage a historic environment receptor sufficiently to lead to a loss of classification.
Major accidents associated with the Proposed Works. An	**Human population receptors**	Preparations for Quiescence,	Medium	Very small chance of occurring		Whilst the majority of chemicals and fuels will be removed during the Preparations for Quiescence phase, there will be some

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
accidental release of hazardous chemical or firewater run-off contaminated with Dangerous Substances		Final Site Clearance				residual inventories of hazardous substances that will be removed during Final Site Clearance phase. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to ALARP. These are set out in **Chapter 18, Appendix 18B.**
	Land receptors	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant	Although a significant fraction of the chemicals and fuels have already been removed from site, it is noted that the majority of chemicals and fuels will be removed prior to Preparations for Quiescence phase. While the site is no longer a COMAH establishment, there will still be some inventories of diesel fuel and other oils on site. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to ALARP. These are set out in **Chapter 18, Appendix 18B.**
	Water receptors	Preparations for Quiescence, Final Site Clearance	High	Very small chance of occurring	Not Significant	Although it is noted that the majority of chemicals and fuels will be removed prior to Preparations for Quiescence phase, and will be reduced further below the thresholds in the COMAH regulations,

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
						there will still be some hazardous materials on site. The most likely release pathway is entrained in firewater to surface water drains and containment systems or overland. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to ALARP. These are set out in **Chapter 18, Appendix 18B.**
Run-off of contaminated fire water from non-process/ non-rad fire/ explosion (e.g., building fires) associated with the Proposed Works.	**Land and Water receptors**	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant	A building fire on site would be tackled with local and portable firefighting equipment. There is the potential for some firewater to contain combustion products, but should not contain any significant chemical or fuel inventory (see scenario above). Worst credible consequence: Firewater, if released overland, could impact the adjacent Blue Anchor to Lilstock Coast SSSI, but the area affected would be limited and short term. If released via the surface water drainage, then it could impact the marine receptor and Severn Estuary Ramsar/SAC/SPA sites but the area affected would be limited and would

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
						recover in short term. Therefore, it is not considered to be a major accident. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to ALARP. These are set out in **Chapter 18, Appendix 18B.**
Major accidents caused by physical effects associated with the Proposed Works, (structural collapse, impact, dropped or swung load, high energy pipe/ equipment failure, collapse of excavation).	**Human population receptors**	Preparations for Quiescence, Final Site Clearance	High	Very small chance of occurring	Not Significant	The Proposed Works will require a significant amount of construction and demolition with associated earthworks. These works will require the use of significant heavy plant vehicles, lifting equipment and temporary structures which are well recognised hazards in the demolition industry. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to ALARP. These are set out in **Chapter 18, Appendix 18B.**
	Historic environmental receptors	Preparations for Quiescence and Final Site Clearance	Not MA&D	N/A	Not Significant	The Proposed Works will require a significant amount of construction and demolition with associated earthworks. These works will require the use of significant heavy plant vehicles, lifting equipment and temporary structures which are well recognised hazards in the

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
						demolition industry. However, the hazards of these activities are typically limited to the immediate vicinity of the works as the hazards relate to dropped or falling objects. While there is a Scheduled Monument within the Study Area, it is several hundred metres from the Works Area. Given the distance between the Proposed Works and the receptors it is not considered credible that a physical accident on site could damage an historic environment receptor sufficiently to lead to a loss of classification.
Natural disasters where the Proposed Works have a material effect on the extent and severity of the disaster.	**Human population receptors** No risk of a direct fatality has been identified.	Preparations for Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant	The potential effects of flooding are considered in **Chapter 11: Surface Water and Flood Risk**. A significant seismic incident affecting the Proposed Works leading to a loss of life is not considered to be credible. The design of the project will account for all foreseeable loads with due consideration of the changes due to climate change including wind speeds, precipitation, drought, extreme high/low temperatures.

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
	Water and Land Receptors	Preparations for Quiescence, Quiescence, Final Site Clearance	High	Remote chance of occurring	Not Significant	Potential flooding of area leading to contamination of water supply/ ground conditions of site. There will be some remaining inventories of diesel fuel and other oils into the Preparations for Quiescence phase which could be released in a worst case flood event. The consequences have been assessed based upon the risk from the operational station which is considered to be conservative. The Site Licensee will implement management measures so the residual risk of harm from all activities to human population will be reduced to ALARP. These are set out in **Chapter 18, Appendix 18B.**
Major accidents caused by events external to the decommissioning where the Proposed Works have a material effect on the extent and severity of the accident: This includes aircraft crash, projectiles, domino effects from an industrial accident in the vicinity, and loss of key utility (power	**Human population receptors**	Preparations for Quiescence, Quiescence, Final Site Clearance	High	Remote chance of occurring	Not Significant	A major accident occurring at the adjacent HPA site during their Preparation for Care and Maintenance phase (until 2040) is unlikely to cause any serious harm to receptors associated with the Proposed Works during the Preparations for Quiescence phase. If an accident were to occur during the Final Site Clearance of HPA, then the Proposed Works would be in the Quiescence phase with minimal or no receptors which could be impacted. No MA&D potential identified.

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
supply, water supply) etc; and This excludes security, cyber-security and malicious acts.						HPC is being constructed to the west of the Site, although it is buffered by the HPA site. HPC is currently undergoing intensive construction but during the Preparations for Quiescence phase, HPC will be in commissioning and then the early stages of power generation. HPC has a design operational life of 60 years, which will be during the Preparations for Quiescence and Quiescence phases. HPC will then be in a state of decommissioning during the Final Site Clearance phase. HPC will be regulated under a Nuclear Site License and associated Safety Case by the ONR. It is considered to be extremely unlikely that a Major Accident with offsite hazards could occur at a Licensed Site. However, there remains a small possibility of a large-scale nuclear accident. No other significant industrial activities have been identified in the vicinity of the Works Area. The design of the Proposed Works will account for the potential loss of utilities e.g. power and communications. The majority of process systems will be regulated by the Nuclear Safety Case or COMAH Regulations and will therefore be

Major Accident and Disaster Scenario	Potential impact on receptors (worst case)	Relevant Phases of the Proposed Works	Severity	Likelihood	Significance	Summary of Rationale
						out of scope. All systems will be designed to fail safe and therefore loss of utilities should not lead to a major accident. The potential for an external hazard such as a plane crash to impact directly on the Proposed Works workforce is so low, it is not considered a credible major accident.
	Water and Land Receptors	Preparations for Quiescence, Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant	No credible major accident scenarios identified.
	Historic environment receptors .	Preparations for Quiescence, Quiescence, Final Site Clearance	Not MA&D	N/A	Not Significant	No credible major accident scenarios identified

Table 22-14 - Summary of residual effects for conventional waste

Receptor	Summary of Predicted Effect	Magnitude of Change	Significance	Summary of Rationale
Conventional waste: Third party (off-site) inert waste facilities	No inert waste to be despatched off-site for final treatment/ disposal. All such material (~15,000 tonnes in total) to be managed on site.	Negligible	Not Significant	No inert waste is to be despatched off-site for disposal.
Conventional waste: Third party (off-site) non-hazardous waste facilities	~67,000 tonnes of non-hazardous waste to be despatched off-site for final treatment/ disposal over a 13-year decommissioning period. In the worst-case year (year 3) ~9,500 tonnes of non-hazardous waste will require off-site disposal.	Minor Negative	Not Significant	The quantities of non-hazardous waste to be despatched off-site in the worst-case year is significantly less than 50,000 tonnes per annum.
Conventional waste: Third party (off-site) hazardous waste facilities	~5,700 tonnes of hazardous waste to be despatched off-site for final treatment/ disposal over a 13-year decommissioning period. In the worst-case year (year 12) ~1,400 tonnes of hazardous waste will require off-site disposal.	Minor Negative	Not Significant	The quantities of hazardous waste to be despatched off-site in the worst-case year is significantly less than 20,000 tonnes per annum.

22.3 Summary of significant effects

Throughout the Preparation for Quiescence, Quiescence and Final Site Clearance phases, several adverse and beneficial residual effects have been identified. With the exception of Localised Significant visual effects at peak times of activity during the Preparations for Quiescence and Final Site Clearance phases of the Proposed Works at HPB (on an individual basis) and likely Significant socio-economic effects on Workers at HPB at a local level, all residual effects arising from the Proposed Works are considered to be not significant following the implementation of embedded measures and mitigation measures outlined within each of the technical aspect chapters (**Chapters 6** – **20**) of the ES.

22.3.1. Localised Significant visual effects at peak times of activity during the Preparations for Quiescence and Final Site Clearance phases of the Proposed Works at HPB (on an individual basis) for the following receptors:

- residents at a small number of locations on the western edge of Stolford;
- westbound walkers using the King Charles III England Coast Path / West Somerset Coast Path from an approximately 2.5 km section of the routes between Stolford and the western edge of the Site;
- eastbound walkers using the King Charles III England Coast Path / West Somerset Coast Path, from an approximately 750 m section as it passes to the north of HPA/HPB; and
- a small proportion of the local routes within PRoW network D (Wick to Stolford), particularly from local PRoWs 23/95, 23/107 and 23/101 close to the coastline to the east of HPB.

22.3.2. There is limited scope to provide further mitigation over and above those measures identified within **Chapter 14: Landscape and Visual Impact Assessment**. However, whilst significant effects are likely on views from the receptors to the Proposed Works, these effects are transient in nature due to the phased approach to deconstruction, dismantling, decommissioning, and construction works.

22.3.3. At the local level, the effects of the HPB staff reductions would result in a significant effect on Workers at HPB. Embedded measures to reduce these socio-economic effects as reasonably practicable include the following:

- Undertake career aspirational discussions with staff;
- Offer contractual redundancy schedules;
- Assist workers with necessary retraining to facilitate suitability for decommissioning at HPB roles or alternative roles within the Applicant organisation;
- Specific collaboration with HPC on deployment opportunities;
- Work with third-parties to advertise new opportunities for staff; and
- Continue to support staff with post-employment references for alternative posts.

22.4 Summary of assessment of cumulative effects

22.4.1. **Chapter 21: Cumulative Effects Assessment** of the ES presents the cumulative effects assessment of the Proposed Works, including an assessment of potential intra-effects which may occur due to multiple impacts on a single receptor and potential inter-project cumulative effects with other developments.

Intra-project effects

22.4.2. **Chapter 21: Cumulative Effects Assessment** identifies that there is the potential for intra-effects in relation to residents within the rural communities close to HPB and visitors to the area (including the users of Public Rights of Way, local walks and roads), during the Preparations for Quiescence and Final Site Clearance phases.

22.4.3. These receptors are likely to experience combined effects from noise, reduced visual and recreational amenity, and changes to landscape character, albeit on a temporary basis. With the adoption of good practice environmental management as set out within the Environmental Management Plan (EMP) the combined effect would be minimised as far as practicable. No significant intra-project effects are anticipated.

Inter-project effects

22.4.4. The inter-project cumulative effects assessment with other developments considered the potential for significant effects of the Proposed Works in-combination with other developments and plans. With the exception of landscape and visual, the assessment demonstrates that the Proposed Works is not likely to result in cumulative significant effects arising from the effects of the Proposed Works combining with the effects of the identified cumulative schemes.

22.4.5. The landscape and visual impact assessment identified the likely cumulative significant effects on the following receptors as a consequence of the construction and operation of HPC:

- landscape character (Eastern Lowlands Sub Area, the Coast (St Audries to Hinkley Point) Sub Area and Wick Moor and Coast Sub Area); and
- views (residents at Stolford, users of the King Charles III England Coast Path / West Somerset Coast Path, users of the Castles & Coast Way, users of local PRoW Networks A, B, C and D, users of Open Access Land and users of Wick Moor Drove) as a consequence of the construction and operation of HPC.

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