

Habitats Regulations Assessment: Site Report for Hinkley Point

EN-6: Revised Draft National Policy Statement for Nuclear Power Generation

Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement

Habitats Regulations Assessment (HRA) screening and Appropriate Assessment (AA) of the revised draft Nuclear NPS including potentially suitable sites, has been undertaken in parallel with the Appraisal of Sustainability (AoS). These strategic assessments are part of an ongoing assessment process that will continue with project level assessments. Applications to the IPC for development consent will need to take account of the issues identified and recommendations made in the strategic, plan level HRA/AA; and include more detailed project level HRA as necessary.

The Habitats Regulations Assessment is provided in the following documents:

HRA Non-Technical Summary

Main HRA of the revised draft Nuclear NPS

- Introduction
- Methods
- Findings
- Summary of Sites
- Technical Appendices

Annexes to the Main HRA Report: Reports on Sites

- Site HRA Reports
- Technical Appendices

All documents are available on the website of the Department of Energy and Climate Change at www.energynpsconsultation.decc.gov.uk

This document is the Habitats Regulations Assessment Site Report for Hinkley Point.

This document has been produced by the Department of Energy and Climate Change based on technical assessment undertaken by MWH UK Ltd with Enfusion Ltd and Nicholas Pearson Associates Ltd.

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1 Introduction

This HRA Report

- 1.1 This report sets out the Habitats Regulations Assessment (HRA) Screening and Appropriate Assessment components of the HRA of the proposals for Hinkley Point. This site was nominated into the Strategic Siting Assessment (SSA) process to be considered as a potentially suitable site for the deployment of a new nuclear power station(s) by 2025. This site report is one of the Site HRA Reports comprising Part III of the HRA Report that accompanies the revised draft Nuclear National Policy Statement (NPS). Part II of the HRA report for the revised draft Nuclear NPS sets out details of the HRA process, methods, findings and summary of the individual assessments at the nominated sites. Part I of the HRA report is a Non-Technical Summary.
- 1.2 This HRA has been undertaken at a strategic level and is part of an ongoing assessment process that started in July 2008 and will continue with project level assessments. It should be noted that initial pre-application consultation on the scope of the Environmental Impact Assessment (EIA) has been undertaken by the nominator EDF Energy, a Scoping Opinion has been issued by the Infrastructure Planning Commission, and further pre-application EIA work is currently being undertaken by EDF¹. Sites that are assessed to be potentially suitable for the deployment of new nuclear power stations by 2025, will be listed in the Nuclear NPS; developers will be able to apply to the Infrastructure Planning Commission² for development consent to develop new nuclear power stations at those sites.
- 1.3 Each development consent will need to be accompanied by a project level HRA report, alongside an Environmental Statement reporting the findings of a detailed EIA. The proposals will also be subject to various other regulatory and licensing requirements.

The revised draft Nuclear National Policy Statement

- 1.4 The revised draft Nuclear NPS sets out a list of sites that following the Strategic Siting Assessment have been found to be potentially suitable for the siting of new nuclear power stations, and the framework by which planning consent decision on the sites should be made by the Infrastructure Planning Commission.

¹ http://infrastructure.independent.gov.uk/?page_id=202

² The Government announced in June 2010 its intention to amend the Planning Act 2008 and abolish the IPC. In its place, the Government envisages that a Major Infrastructure Planning Unit (MIPU) will be established within the Planning Inspectorate. Once established, the MIPU would hear examinations for development consent and would then make a recommendation to the Secretary of State. It would not itself determine applications and decisions would be taken by the relevant Secretary of State. These proposed reforms require primary legislation. Until such time as the Planning Act 2008 is amended, the IPC will continue as set out in that Act. As a result, the NPSs will provide the framework for decisions by the IPC on applications for development consent for major infrastructure projects, and under the new arrangements will provide the framework for recommendations by the MIPU to the Secretary of State.

HRA Process

- 1.5 The Habitats Directive³ protects habitats and species of European nature conservation importance. Together with the Birds Directive⁴, the Habitats Directive established a network of internationally important sites designated for their ecological status. Special Protection Areas (SPAs) are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. Special Areas of Conservation (SACs), and Sites of Community Importance (SCIs) are designated and defined under the Habitats Directive and promote the protection of flora, fauna and habitats. Internationally important wetlands are designated under the Ramsar Convention 1971. UK Government policy states that the Ramsar sites are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them⁵. These sites combine to create a Europe-wide 'Natura 2000' network of European Sites, which are hereafter referred to as 'European Sites'⁶ in this and other HRA reports⁷.
- 1.6 HRA tests whether the impacts identified as arising from a proposal, plan or project are likely to have a significant effect on European Sites of nature conservation importance. Article 6(3) of the Habitats Directive requires an 'appropriate assessment' to be undertaken on proposed plans or projects which are not necessary for the management of the European Site, but which are likely to have a significant effect on one or more European Sites either individually, or in combination with other plans, programmes or projects. In England and Wales this requirement was transposed into UK law by the Conservation of Habitats and Species Regulations 2010⁸ ('the Habitats Regulations'). The process of fulfilling the requirements of the Directive and the Regulations is now in practice referred to as HRA, and Appropriate Assessment (AA) if required, forms a stage within the overall HRA process.
- 1.7 The full details of the HRA method and process, including the key principles and any assumptions made in this plan level HRA of the revised draft Nuclear NPS and nominated sites; are outlined in Part II of the HRA Report. This report covers the screening and Appropriate Assessment (AA) stages of the HRA for the nominated site at Hinkley Point, as outlined in Table 1. It takes into account the information contained within the site nomination submitted to Government by a developer (EDF Energy) on 31 March 2009⁹. The process is typically

3 Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna

4 Council Directive 79/409/EEC on the protection of wild birds: <http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1979/L/01979L0409-20070101-en.pdf>

5 ODPM, 2005, Planning Policy Statement 9: Biological and Geological Conservation; and ODPM Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System

6 Ramsar sites are included within the definition of European sites for the purposes of this report.

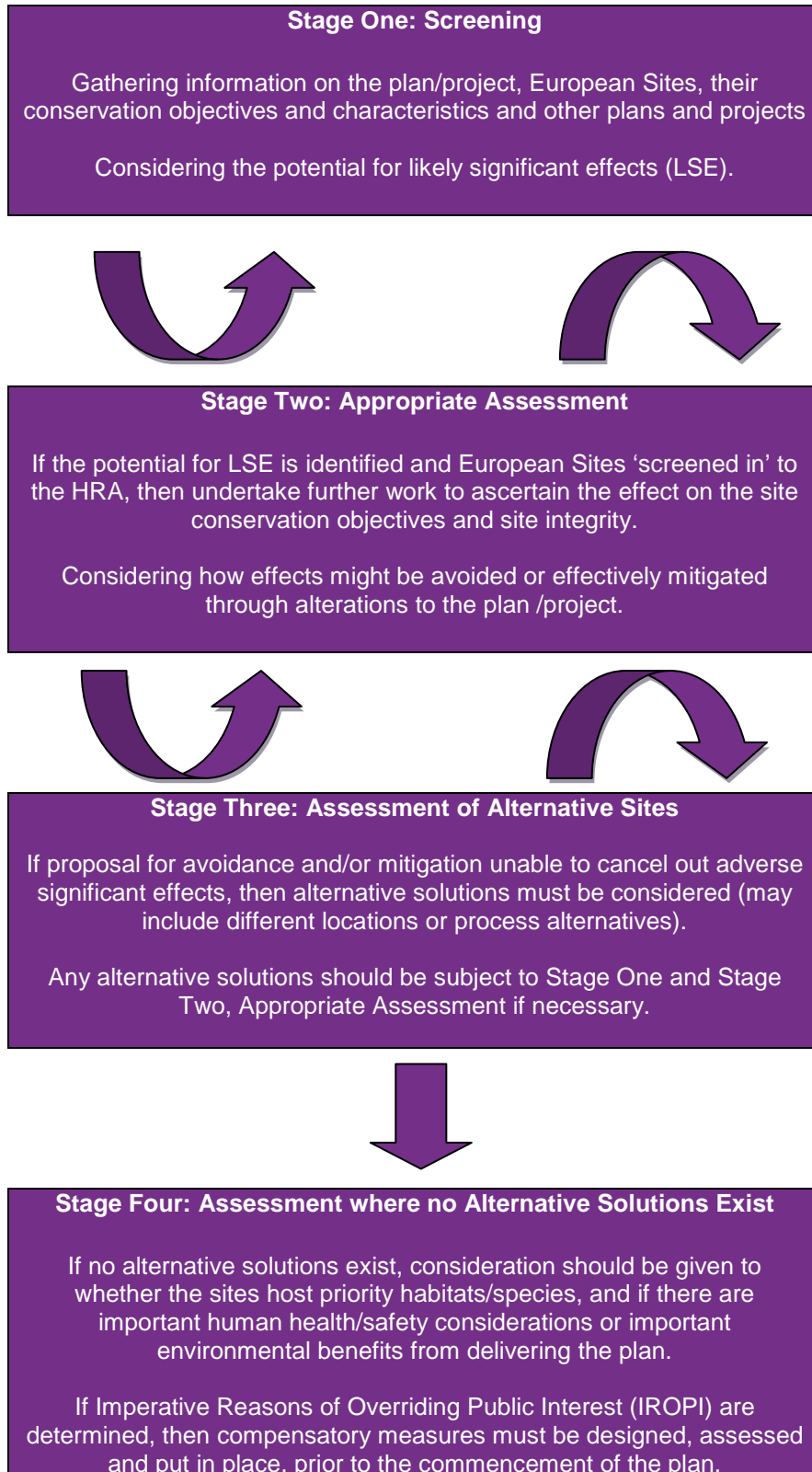
7 The term European Site is used throughout all the Site HRA Reports and in the Main HRA Report, and incorporates SACs, SPAs, SCIs and Ramsar sites.

8 Regulation 106 applies the requirements and controls in relation to plans under the regulations to National Policy Statements designated under the Planning Act 2008

9 <http://www.energy-nps-consultation.decc.gov.uk>

iterative and assessments have been revised on the basis of commentary from the Statutory Consultees and comments received during the public consultation which took place between November 2009 and February 2010.

Table 1: Habitats Regulations Assessment: Summary Overview of Key Stages ¹⁰



¹⁰ Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6 (3) and (4) of the Habitats Directive 92/43/EEC. European Commission DG Environment (2001) http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

2 HRA Screening of Hinkley Point

2.1 The nominated site¹¹ is situated to the west and south of Hinkley Point A and B nuclear power stations on a rocky headland on the Somerset coast, 14 km east of Watchet and to 13 km north west of Bridgwater (approximate grid reference of the centre point of the nominated site being 320300, 145850). The location of the site is shown in Figure 1.

Screening

2.2 The screening process forms the first stage of any HRA and is focused on the 'likely significant effect' (LSE) test. The aim of the LSE test is to determine whether the plan either alone, or in-combination with other plans and projects is likely to result in a significant effect at European Site[s]. This is essentially a risk assessment process that seeks to understand whether there are any mechanisms for identified impacts arising from the plan to adversely affect the European Sites (i.e. a cause-effect pathway)¹². The key questions asked are:

- would the effect undermine the conservation objectives for the European Site?
- can significant effects be excluded on the basis of objective information?

2.3 The tasks undertaken to complete the screening process for Hinkley Point are described below.

European Site Identification and Characterisation

2.4 European Sites within a 20km¹³ radius of the nominated site were scoped into the screening process as set out in Table 2a and Figure 2. This area of search reflects guidance recommendations¹⁴, but also takes into account that distance is in itself not a definitive guide to the likelihood or severity of impacts known to arise from developments (for example inaccessibility/ remoteness is typically more relevant) and factors such as the prevailing wind directions, river and groundwater flow direction will all have a bearing on the relative distance at which an impact can occur. In addition, two sites (River Usk SAC and River Wye SAC) which fall outside the search area (see Table 2b below), but that have hydrological connections to the Severn Estuary designations, were included in the Screening Assessment in line with consultation comments provided by Statutory Consultees.

11 As proposed through the nomination process

12 Appropriate Assessment of Plans (Therivel, May 2008)

13 For the purposes of the Hinkley Point HRA the River Usk SAC and the River Wye, which at 30km from the site, falls outside of this search area but has hydrological connections to the other European site designations, was therefore included in the Screening Assessment

14 Communities and Local Government (2006) Planning for the Protection of European Sites: Appropriate Assessment – Guidance for Regional Spatial Strategies and Local Development Documents.

Table 2a: European Sites within 20km of the nominated site

	Designation	Distance from the nominated site ¹⁵
Exmoor and Quantocks Oakwoods	SAC	within 10 km
Hestercombe House	SAC	within 20 km
Mendip Limestone Grasslands	SAC	within 20 km
Severn Estuary	SAC	adjacent
Severn Estuary	SPA	adjacent
Severn Estuary	Ramsar	adjacent
Somerset Levels and Moors	SPA	within 5 km
Somerset Levels and Moors	Ramsar	within 20 km

Table 2b: European Sites outside 20km of the nominated site

	Designation	Distance from the nominated site ¹⁶
River Usk	SAC	within 40 km
River Wye	SAC	within 56 km

2.5 **Appendix 1** details the characteristics of the ten European Sites scoped into the HRA screening assessment. The characterisations include an overview of the sites’:

- ecological features;
- their qualifying features/ reasons for designation;
- conservation objectives and the condition status of their constituent Sites of Special Scientific Interest (SSSIs) where available;
- environmental conditions necessary to support site integrity; and
- site vulnerabilities, including any key pressures or trends known to be affecting the sites.

Nominated site Review and Identification of Likely Impacts

2.6 The nomination¹⁷ states that the nominated site is an area of approximately 203 hectares, and that an operational footprint of 30-50 ha is likely to be required within this. Cooling water intake and outfall structures and possibly also coastal defences and a construction-phase Marine Off-Loading Facility will also be required beyond the nominated site boundary. The nominator was not required to provide further details of the proposed development at this stage.

¹⁵ Distance measured is from the nearest site boundary.

¹⁶ Distance measured is from the nearest site boundary.

¹⁷ Nomination documents submitted by the developer (the Nuclear Decommissioning Authority), at <http://www.nuclearpowersiting.decc.gov.uk/nomination/hinkleypoint/>

- 2.7 From the nomination documents¹⁸ it is assumed that the nomination is for a nuclear power station development, incorporating:
- two nuclear reactors;
 - construction phase areas and facilities, including a Marine Off-Loading Facility
 - flood defence improvements and coastal defence protection measures;
 - cooling water infrastructure, including intake and outfall structures;
 - infrastructure and facilities related to the operation of a nuclear power station including transmission infrastructure and new access roads; and
 - interim radioactive waste storage facilities.
- 2.8 The full range of potential impacts on environmental conditions and biodiversity arising from the development of new nuclear power stations are outline and discussed in Part II of the HRA Report. Impacts of particular relevance to the nominated site include: direct habitat loss, fragmentation and disturbance, and effects on the (marine) water environment. These issues are discussed in detail in the Screening Assessment task below.

Identification and Consideration of Other Plans, Programmes and Projects

- 2.9 It is a requirement of Article 6(3) of the Habitats Directive that HRA examines the potential for plans and projects to have a significant effect either individually or 'in combination' with other plans and projects (PPPs). The aim is that plans and projects are evaluated within the context of the prevailing environmental conditions and that account is taken of their effects.
- 2.10 Plan level HRA practice has shown that the in-combination assessment is most relevant where plans might otherwise be screened out because their individual contribution is inconsequential. The requirement is that the HRA assessment process should take account of reasonably foreseeable impacts (as opposed to every conceivable effect)¹⁹.
- 2.11 For the purposes of this assessment consideration was given to:
- Local Development Framework documents;
 - Major Development Schemes (including transport plans/ airport/port expansion/tidal power schemes) where relevant; and
 - (Coastal) Tourism Strategies.
- 2.12 Where relevant, reference was also made to:

¹⁸ Op cit.

¹⁹ Tyldesley, D. (2009) The Habitats Regulations Assessment of Local Development Documents. Revised Draft Guidance for Natural England. Natural England, Sheffield.

- Coastal Habitat Management Plans;
- Catchment Abstraction Management Strategies;
- Catchment Flood Management Plans;
- River Basin Management Plans;
- Minerals and Waste Development Frameworks;
- Shoreline Management Plans;
- Water Resource Management Plans;
- Flood Risk Management Strategy;
- Decommissioning plans for the existing 'A' station; and
- Environment Agency's Review of Consents.

2.13 A summary of the key plans referred in the in-combination assessment process are provided in **Appendix 2**. Screening Assessment

Screening Assessment

2.14 The following sections outline the key issues arising from the Screening Assessment (LSE test) undertaken in detail at **Appendix 3**, for Hinkley Point. The Screening Assessment indicated that development at Hinkley Point has the potential to adversely affect European Sites as a result of:

- **Water Resources and Quality Impacts**
- **Habitat (and Species) Loss and Fragmentation**
- **Coastal Squeeze**
- **Disturbance (Noise, Light and Visual)**

2.15 The screening also identified **Air Quality** as a potential issue and considers that while potential adverse effects are unlikely; this finding should be confirmed by further information gathering in the Appropriate Assessment stage. Each of these issues is considered in turn below.

Water Resources and Quality Impacts

European Sites for which no significant effects are likely (see Appendix 3):

- Exmoor and Quantocks Oakwoods SAC
- Hestercombe House SAC
- Mendip Limestone Grasslands SAC

European Sites for which significant effects are likely (see below):

- Severn Estuary SAC, SPA, Ramsar
- Somerset Levels and Moors SPA, Ramsar
- River Wye SAC
- River Usk SAC

- 2.16 The quality of fresh and marine water that feeds and supports European Sites is a key determinant in ensuring the integrity of habitats and dependant species. Poor water quality can result from changes to salinity, temperature, from toxic compounds (that may also bind to sediments) and from wider sources of contaminants for example, pesticides that can act as endocrine disruptors²⁰. These factors may interact leading to death of aquatic life and increasing the vulnerability of species to disease. Nutrient enrichment in water (eutrophication) can affect the availability of oxygen, changing habitat composition with direct impacts on dependant species.
- 2.17 The HRA Screening Assessment highlighted the potential for impacts on water resources and quality arising from the construction, operation and decommissioning phases of Hinkley Point. Issues include:
- increased/ altered drainage from earthworks and excavations and potential sedimentation changes;
 - alteration of flow through abstraction and the return of additional water volumes to the aquatic system;
 - changes to water temperature creating ‘thermal plumes’ as a result of controlled discharges;
 - the potential for toxic contamination (for example from anti-fouling agents associated with cooling water systems) from accidental leakage may interact or combine with routine non-radioactive or radioactive discharges that will be subject to discharge consents regulated by the Environment Agency. Moreover, non-radioactive highly toxic chemicals, such as boric acid, which is periodically released as part of routine water discharges will break down with time, but this may not occur quick enough to avoid impacts on invertebrate populations which are the prey species for the qualifying bird populations.
- 2.18 Of the eight European Sites screened, seven sites are identified as possessing specific vulnerabilities relating to the water resource (Severn Estuary SAC, SPA, Ramsar; Somerset Levels and Moors SPA, Ramsar; River Usk SAC and River Wye SAC).

Severn Estuary SAC, SPA, Ramsar

River Wye SAC

River Usk SAC

- 2.19 The Severn Estuary SAC is particularly vulnerable to contamination from toxic compounds²¹, with the intertidal mudflats, sandflat and saltmarshes (which are the primary qualifying features of the SAC) highly vulnerable to the introduction of synthetic and non-synthetic compounds. The interest features of the Severn Estuary SPA (Bewick Swan and migratory bird species) are dependent on the mudflat,

20 Marine Biological Association (2003). The Characterisation of European Sites: The Severn Estuary. (possible) Special Area of Conservation and Special Protection Area. Occasional Publication No. 13.

21 NE/CCW observations, Appendix 1: European Site Characterisations.

sandflat and saltmarsh habitats which may be subject to changes through altered sediment flows (although current studies suggest that intertidal changes are likely to be minimal)²². Contamination is a particular issue for these species either through direct contact or accumulation of toxins through the food chain, including within fish species (Lamprey/Shad) which are a qualifying feature of the SAC. This range of issues is also directly relevant for the Severn Estuary Ramsar designation.

- 2.20 The migratory fish species (Sea and River Lamprey and Twaite Shad) are qualifying features shared between the River Usk, the River Wye and the River Severn European Sites. The habitats in these rivers, including spawning and nursery areas, are necessary for the completion of the species' lifecycles. Therefore, the conservation objectives of these three European Sites require that the fish species as qualifying features can only be in favourable condition if the conservation objectives relating to all three sites are also met in full and there is a continued recorded presence of the species. These fish migrate up and down the channel past Hinkley Point and although the channel is wide, habitat adjacent to the site is likely to be used by these species at possible nursery and feeding grounds. Effects on these species at Hinkley may therefore effect their populations in the River Usk and River Wye. Changes in water quality such as through nutrient loading can result in enrichment (eutrophication). Excess nutrients can alter sensitive vegetation communities of aquatic habitats whilst exacerbating colonisation by more generalist and invasive species. Algal blooms resulting from excess nutrient input can also impact upon the availability of oxygen in waters, whilst the discharge of cooling water up to 10°C warmer²³ from the development can further reduce the amount of soluble oxygen available (as oxygen is less soluble at higher temperatures). Such alterations in water temperature and the availability of oxygen and can result in artificial thermal and chemical barriers to species and communities, significantly affecting the qualifying features of European Sites.

Somerset Levels and Moors SPA, Ramsar

- 2.21 The Somerset Levels and Moors SPA/ Ramsar is spread over a series of individual locations to the east of Hinkley Point and the potential impacts arising from Hinkley Point in relation to water quality are unlikely to result in direct impacts at this designation. However, the European Site's interest features are shared with the Severn Estuary, and there are potential for indirect impacts (i.e. where transitory/ migratory birds common to both sites are affected). Therefore this issue should be considered further through Appropriate Assessment.

22 Severn Estuary Coastal Habitat Management Plan (CHaMP) 2009.

23 BERR (July 2007). Towards a Nuclear National Policy Statement – Applying the proposed Strategic Siting Assessment criteria: a study of the potential environmental and sustainability effects.

- 2.22 **The HRA Screening Assessment indicates that the potential for adverse effects upon the integrity of the Severn Estuary SAC, SPA and Ramsar, upon the River Usk SAC, River Wye SAC and upon the Somerset Levels and Moors SPA and Ramsar sites should be considered further through Appropriate Assessment.**

Habitat (and Species) Loss and Fragmentation

European Sites for which no significant effects are likely (see Appendix 3):

- Somerset Levels and Moors SPA, Ramsar
- Exmoor and Quantocks Oakwoods SAC
- Hestercombe House SAC
- Mendip Limestone Grasslands SAC

European Sites for which significant effects are likely (see below):

- Severn Estuary SAC, SPA, Ramsar
- River Wye SAC
- River Usk SAC

- 2.23 Habitat loss and fragmentation in relation to European Site integrity can occur naturally (for example, tree fall, changing flow patterns) or as a result of human intervention. Direct anthropogenic impacts (for example through road building, flood defences) can result in barriers to migration, remove habitat areas which cannot easily be recreated, change nutrient flows, or remove area habitat connectivity.

- 2.24 The HRA Screening Assessment noted the potential for direct impacts through habitat loss and fragmentation from the construction phases of development at Hinkley Point. In particular, direct loss of habitat will occur as a result of the nomination which proposes to extend Hinkley Point's boundaries to the margins of adjacent European Sites, and encroach onto the designated foreshore through the construction of new coastal frontages. Cooling water culverts will also be required to extend into the adjacent European Sites and the development of a construction-phase marine landing site, at a distance from Hinkley Point may affect designated sites.

- 2.25 These direct impacts are specifically relevant to the Severn Estuary SAC, SPA and Ramsar sites. The physical loss of habitats is an identified vulnerability for the SAC, and the statutory bodies (NE/CCW) note the loss of intertidal areas as being particularly significant for the qualifying features (intertidal mudflats, sandflat and saltmarshes) of this site (Appendix 1).

- 2.26 Loss of habitat is also significant for the SPA interest features (Bewick Swan and other migratory bird species), and is likely to lead to

displacement and disturbance with commensurate impacts on breeding and feeding on these bird species. The Severn Estuary Ramsar designation also identifies the physical loss of habitat in intertidal areas as a significant vulnerability, given their role in supporting populations of migratory species and assemblages for wildfowl.

Severn Estuary SAC, SPA, Ramsar

River Wye SAC

River Usk SAC

- 2.27 The development and operation of a new nuclear the power station at Hinkley Point, also has implications for designated fish species in particular the migratory shad species and Atlantic Salmon (Severn SAC, River Usk SAC and River Wye SAC) through the impingement of fish on cooling water intake screens and the entrainment of eggs and larvae as part of the intake cycle²⁴. The conservation objectives for the shad species and Atlantic Salmon require the natural range of these species to be maintained, and this is taken to mean those reaches where predominantly suitable habitat for each life stage exists. Adverse impacts upon migratory fish species in the Severn Estuary may be transferred to populations at the Rivers Wye and Usk. Any detrimental impacts upon these fish may in turn impact negatively on Otter populations
- 2.28 Creation of physical barriers, for example through construction of a marine off-shore landing facility can impact upon breeding and movement of migratory fish species at European Sites adjacent to the nominated site. This may affect the population dispersal of those species to the River Wye SAC and River Usk SAC.
- 2.29 **The effects of habitat loss and fragmentation on the conservation objectives and site integrity of the Severn Estuary SAC, SPA and Ramsar, and upon the River Usk SAC and River Wye SAC should be considered further through Appropriate Assessment.**

Coastal Squeeze

European Sites for which no significant effects are likely (see Appendix 3):

- River Wye SAC
- River Usk SAC
- Somerset Levels and Moors SPA, Ramsar
- Exmoor and Quantocks Oakwoods SAC
- Hestercombe House SAC
- Mendip Limestone Grasslands SAC

²⁴Henderson, P.A (2004).Are coastal power stations affecting Northern European inshore fish populations? [<http://www.irchouse.demon.co.uk/index2-paper001.html>]

European Sites for which significant effects are likely (see below):

- Severn Estuary SAC, SPA, Ramsar

2.30 Coastal squeeze impacts are closely related to habitat loss and fragmentation, and relate specifically to situations where the coastal margin is squeezed by the fixed landward boundary. Coastal squeeze typically arises through the development of flood defences/ reinforcement of coastal margins, preventing natural movement of coastal species and habitats.

Severn Estuary SAC, SPA, Ramsar

2.31 The Screening Assessment identified that development of the nominated site, particularly those to develop a new sea wall, would encroach directly on the margins of the Severn Estuary SAC, SPA and Ramsar site creating coastal squeeze impacts.

2.32 As noted in relation to the issues of habitat loss and fragmentation, these European Sites are all vulnerable to impacts which will remove or change the sensitive, designated intertidal habitats that are constituent parts of the overall site integrity on which migratory bird species depend.

2.33 **The effects of coastal squeeze on the Severn Estuary SAC, SPA, and Ramsar site should therefore be considered alongside habitat loss and fragmentation through further Appropriate Assessment.**

Disturbance (Noise, Light and Visual)

European Sites for which no significant effects are likely (see Appendix 3):

- Somerset Levels and Moors SPA, Ramsar
- Exmoor and Quantocks Oakwoods SAC
- Hestercombe House SAC
- Mendip Limestone Grasslands SAC

European Sites for which significant effects are likely (see below):

- Severn Estuary SAC, SPA, Ramsar
- River Wye SAC
- River Usk SAC

2.34 Disturbance to habitats and species can arise from a number of sources. While recreational activities are frequently implicated in disturbance events, sources are multifarious and can include traffic,

construction activity and intermittent sounds (for example, alarms/sirens). The impacts on bird species of disturbance events are particularly significant and tend to occur on a continuum where the most disturbing activities are those that are irregular, unpredictable loud noise events and movement or vibration of a long duration. Less disturbing are regular, frequent, quiet and predictable patterns of sound or vibration with limited vibration²⁵. The impacts of disturbance on migratory fish (such as frequent vibration) may also be of significance.

Severn Estuary SPA, Ramsar

Somerset Levels and Moors SPA, Ramsar

- 2.35 Overwintering birds (which are qualifying features of the Severn Estuary and Somerset Levels and Moors SPAs) expend unnecessary energy and have reduced feeding times as a result of responding to disturbance events. Displacement between feeding sites can also place pressures on available resources, placing additional pressures on supporting habitats.²⁶ The net effect of these disturbance events is a direct negative impact on species survival.
- 2.36 The Screening Assessment identified disturbance as being of potential significance for the Severn Estuary SPA interest features (Bewick's Swan, migratory water fowl, also cited in the Ramsar criterion), during the construction phase of development. Increased disturbance is likely from a range of sources (lighting, noise and vibration) and may divert birds from their chosen roosting and feeding sites. These disturbance sources and effects may be equally relevant offsite through the construction of marine landing sites and improved road/ rail access.

Severn Estuary SAC, Ramsar

River Usk SAC

River Wye SAC

- 2.37 There is some evidence²⁷ to suggest that Allis Shad are able to survive some types of disturbance (such as gravel extraction near spawning beds) but little is known about the impact of such factors and the precautionary principle should apply until adequate data is available. Regular frequent vibration and light disturbance may be of particular significance for some migratory fish species at breeding, feeding and resting locations. Disturbance such as fluctuating water levels or the change in flow may also have a detrimental effect to breeding migratory species such as shad species.
- 2.38 **Given the extended construction phase of the development and identified sensitivities of the designated species to disturbance events, the potential for adverse effects upon the Severn Estuary**

25 Scott Wilson (Nov 2008) EcoTowns: Sustainability Appraisal and Habitats Regulations Assessment.

26 Gill, Sutherland and Norris (1998) The consequences of human disturbance for estuarine birds. RSPB Conservation Review 12. 67-72.

27 Maitland, P. and Hatton-Ellis, T. W (2003). Ecology of the Allis and Twaite Shad. Conserving Natura 2000 Rivers Ecology Series No. 3.

SAC, SPA and Ramsar, Somerset Levels and Moors SPA and Ramsar, and upon the River Usk SAC and River Wye SAC should be considered further through Appropriate Assessment.

Air Quality Impacts

European Sites for which no significant effects are likely (see Appendix 3):

- Somerset Levels and Moors SPA, Ramsar
- Exmoor and Quantocks Oakwoods SAC
- Hestercombe House SAC
- Mendip Limestone Grasslands SAC
- River Wye SAC
- River Usk SAC

European Sites for which significant effects are likely (see below):

- Severn Estuary SAC, SPA, Ramsar

2.39 The effects of changing and poor air quality at European Sites vary according to the pollutant type, (acid deposition, ammonia, nitrogen oxides, ozone and sulphur dioxide) and the nature of the receiving environment. The key pollutants that are of concern for terrestrial habitats are sulphur dioxide (SO₂), ammonia (NH₃) and nitrogen oxide (NO_x). Deposition of nitrogen can lead to soil enrichment and sulphur dioxide to acidification; altering the species composition, with impacts on associated species.

2.40 Background air quality in the UK has improved progressively and is expected to continue to improve significantly over the next 15 years with tightening emissions standards and moves towards 'cleaner' energy generation. Pollution levels for all key pollutants in the rural area around Hinkley Point are typically low²⁸.

Severn Estuary SAC, SPA, Ramsar

2.41 The HRA Screening Assessment noted the potential for impacts on air quality at a local level arising from development of the nominated site. These impacts are considered to arise in particular from the construction and decommissioning processes (for example, fugitive dust and airborne particulates) not only from the decommissioning of Hinkley A but also potentially Hinkley B. Increased traffic generation is also of concern during construction, and major roads within 200 m have the potential to increase nitrogen and carbon emissions impacts from vehicles²⁹.

28 AEA Energy (2007) Air Pollution in the UK.

29 Department for Transport (2003). Transport Analysis Guidance, the Local Air Quality Sub-Objective TAG Unit 3.3.3.

- 2.42 The assessment also noted the potential for radioactive releases to the atmosphere, but that regulatory sources indicate aerial (radioactive) emissions to be low and cause little (human) and biodiversity radiation exposure³⁰.

Severn Estuary SAC, SPA, Ramsar

- 2.43 The HRA screening of the European Sites that may be impacted by potential changes to local air quality (Severn Estuary SAC, SPA, Ramsar) did not identify air quality as a specific vulnerability for the qualifying and interest features of the site. It is assessed that local level impacts (that can be managed and monitored through site level processes) are unlikely to result in significant impacts.
- 2.44 However, given the role of air quality in maintaining the overall site integrity of European Sites, and the development proposed through other plans (for example, Local Development Frameworks) it is considered relevant to gather further air quality data to confirm a 'no significant effect' finding and ensure that supporting environmental conditions will not be adversely affected by development at Hinkley Point.
- 2.45 **In line with the precautionary principle further information should be gathered as part of the Appropriate Assessment stage to address potential uncertainties identified in relation to air quality issues.**

Conclusions and Recommendations

- 2.46 In line with the screening requirement of the Habitats Directive and Regulations, an assessment was undertaken to determine the likely significant effects of the development at Hinkley Point on the eight European Sites that lie within 20km of the nominated site as well as the River Usk SAC and the River Wye SAC. The River Usk SAC and River Wye SAC falls outside of this search area but have hydrological connections to the other European Site designations and were included in the Screening Assessment in line with consultation comments provided by Statutory Consultees. The HRA Screening assessment and conclusions were:
- The information gathered on the European Sites – **Appendix 1**;
 - The summary analysis of potential environmental impacts generated by the development activities arising from Hinkley Point;
 - Consideration, where necessary, of other plans and programmes that have spatial/ contextual relevance – **Appendix 2**
 - Government guidance which indicates that HRA for plans is typically broader and more strategic than project level HRA and

30 Environment Agency (2005). Measuring Environmental Performance, Sector Report for the Nuclear Industry.

that it be undertaken at a level that is proportionate to the available detail of the plan.

- 2.47 The Screening Assessment, presented in detail in **Appendix 3**, identified a number of key impacts arising from the development and the potential for significant effects at five of the European Sites scoped into the screening process. These findings are summarised in Table 3 below.

Table 3: Summary of Likely Significant Effect Screening

European Sites	Water Resources and Quality	Habitat Loss and Fragmentation	Coastal Squeeze	Disturbance (Noise, Light, Visual)	Air Quality
Exmoor and Quantocks Oakwoods SAC	✗	✗	✗	✗	✗
Hestercombe House SAC	✗	✗	✗	✗	✗
Mendip Limestone Grasslands SAC	✗	✗	✗	✗	✗
River Usk SAC	✓	✓	✗	✓	✗
River Wye SAC	✓	✓	✗	✓	✗
Severn Estuary SAC	✓	✓	✓	✓	?
Severn Estuary SPA	✓	✓	✓	✓	?
Severn Estuary Ramsar	✓	✓	✓	✓	?
Somerset Levels and Moors SPA	✓	✗	✗	✗	✗
Somerset Levels and Moors Ramsar	✓	✗	✗	✗	✗

Key		
Likely Significant Effect	✓	further Appropriate Assessment required
No Likely Significant Effect	✗	no further Appropriate Assessment required
Significant Effect Uncertain	?	precautionary approach taken and further Appropriate Assessment required

- 2.48 It is recommended that the HRA proceeds to the next stage of 'Appropriate Assessment' in relation to the seven European Sites where the potential for likely significant effects (✓) or significant effect uncertain (?) has been identified. Further work should also be undertaken to determine whether the effect on air quality should be considered as part of the Appropriate Assessment for the Severn Estuary SAC, SPA and Ramsar sites. This next stage of the HRA process is outlined in the following section 3 of this report.

3 HRA Appropriate Assessment of Hinkley Point

Scoping and Additional Information Gathering

- 3.1 To support the Appropriate Assessment (AA) phase, additional information was gathered on the European Sites and environmental condition, in line with the specific issues identified by the screening exercise. This additional information included, air quality data and trends, available from the UK Air Pollution Information System (APIS) and water quality and abstraction data produced by the Environment Agency.

Assessing the Impacts (in-combination) Appropriate Assessment

- 3.2 The HRA Screening Assessment considered whether the impacts arising from a new nuclear power station at Hinkley Point have the potential to significantly affect the integrity of the European Sites scoped into the assessment process. The following sections summarise the analysis undertaken against the conservation objectives of each of the European Sites considered to determine whether the effects are likely to have an adverse effect on European Site integrity, either alone or in-combination with other plans and projects.

Water Resources and Quality

Severn Estuary SAC, SPA, Ramsar

River Wye SAC

River Usk SAC

- 3.3 Current Environment Agency data³¹ indicates that, the ecological and chemical status of the estuarine environments near to Hinkley Point are assessed as 'moderate' and 'high' respectively. By 2015 the Environment Agency predicts that the ecological status will be maintained, but that the chemical quality of the water will decrease to 'good' status. The assessments for the coastal water quality, downstream from Hinkley Point mirror those for the estuarine environment, with a prediction that the chemical quality of the water will decline. The ecological status of the rivers around Hinkley Point is assessed as ranging from 'moderate' to 'good' ecological quality – the chemical condition of these rivers has yet to be assessed. Groundwater chemical quality around Hinkley Point is assessed by the Environment Agency as being 'good'.
- 3.4 Radioactive discharges (including potential accidental discharges from waste storage) are subject to targets monitored by the Environment

31 Environment Agency River Basin Management Plans: South West River Basin District, 2008. UKTG – Water Framework Directive Website: <http://www.wfduk.org/>
Environmental Agency – http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e

Agency and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the Environment Agency in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges from nuclear power stations.

- 3.5 Environmental condition data for the Severn Estuary SAC, SPA, Ramsar and the River Wye SAC and the River Usk SAC (Appendix 1, Site Characterisations) indicates that while water quality (as illustrated by Environment Agency data) has improved, where there are areas of local concern, nutrient loading should be avoided. Therefore, whilst current water quality indicators for the estuary show ecological and chemical levels around Hinkley Point to be 'moderate' or higher, it is not possible (without further information on discharge levels and quality) to conclude that both radioactive and non-radioactive discharges will not have an adverse effect on the Severn Estuary SAC, SPA, Ramsar and the River Wye SAC and River Usk SAC.
- 3.6 Information from surveys in the waters around Hinkley Point (2001)³² suggests that fish abundance has improved, and this is tentatively correlated to trends in rising water temperatures brought in part by climate change. However, it should be noted that rising temperatures are not beneficial to all species of fish and the impacts to individual species must be taken into account³³ (for example, the impacts on shad species being different to those on salmonids). In addition, this study also reported that increases in abundance are coincident with a reduction in the number of direct cooled power stations in the estuary area, but that these observations cannot be regarded as directly linked.
- 3.7 The water resource management unit around Hinkley Point is not managed through the Environment Agency CAMS process due to its tidal nature. The nearest water resource management unit (WRMU) to Hinkley Point at Cannington is over abstracted and identified as having no water available.

Effects in Combination with Other Plans and Projects

- 3.8 Aspects of the following plans and programmes could lead to "in combination" effects with regards to water resources and quality (see Appendix 2).
- The Environment Agency's Review of Consents (RoCs) is ongoing and due for completion in 2010. This process reviews all permits and consents regarding discharge and abstraction which were granted prior to the enforcement of the Habitats Regulations, and ensures that no adverse effects on the nature conservation interests of designated sites are likely to occur under these permissions. Should levels of abstraction and discharge under existing consents and permits within the vicinity of Hinkley Point be reduced, impacts upon water quality and resources within

32 Pisces Conservation Ltd <http://www.irchouse.demon.co.uk/index.html?2-hink2001>

33 <http://www.severnestuary.net/frms/docs/severn%20scoping%20report%20jan%2009%20v2.pdf>

European Sites around Hinkley Point may be reduced such that adverse effects upon site integrity become unlikely.

- The Environmental Statement for the proposed Bristol Deep Sea Container Terminal³⁴ at Avonmouth and the estuary approach channel identifies a number of impacts which are likely to have in-combination effects with the proposed nuclear development at Hinkley particularly upon the Severn Estuary European Sites (SAC, SPA and Ramsar) in relation to water resources and quality. In particular, capital dredging within the turning area and main estuary channel and disposal of the arisings can modify local hydrodynamics and sediment transport around the container terminal, leading to an increase in accretion over SPA and SAC habitats. Subtidal and potentially intertidal deposition of fine sediment within the estuary as a result of dredging and disposal of sediment may also result.
- The Severn Tidal Power HRA preliminary screening^[1] identified the risk of a number of effects of the proposed tidal range power generation schemes. These may have in-combination effects upon the Severn Estuary SAC, SPA, Ramsar and the River Wye and Usk SACs arising from possible impacts to water resources and quality. Identified impacts include alterations to water resources as a result of changes to tidal range and flow upstream and downstream of the proposed barrage or lagoon, and alterations to water quality as a result of changes in land drainage capacity and chemical parameters (including salinity, dissolved oxygen and the dispersion of regulated discharges). The Severn Tidal Power HRA preliminary screening report is not final and will be reviewed in the light of the feasibility study's findings. It covers all five options but does not distinguish between the individual options where impacts will vary³⁵.
- Decommissioning of Hinkley Point power stations A (started in 2003) and B (scheduled for 2016) may also have in-combination effects with the proposed nuclear development at Hinkley Point upon water quality and resources within the Severn Estuary SAC, SPA and Ramsar site, and within the River Wye and Usk SACs, particularly should deconstruction of the existing sites coincide with construction of a new nuclear power station. Potential impacts include increases in pollution and sedimentation of surface-waters and freshwater habitats with detrimental effects on Otters and migratory fish species, changes to groundwater quality

34 Bristol Port Company (2008) Bristol Deep Sea Container Terminal Environmental Statement - Non Technical Summary.

35 The Department of Energy and Climate Change led a two year cross-departmental study to determine whether a tidal power project in the Severn Estuary could be supported. Within the study, a range of five different schemes were assessed, and the scope and scale of environmental, economic and social effects is likely to vary widely between them. Separate environmental studies into these impacts and whether they could be mitigated have been carried out. The assessment in this report is based upon the potential effects outlined in the habitats screening report for Severn Tidal Power. It covers all short-listed schemes but does not distinguish between the individual schemes where environmental impacts will vary. The Severn Tidal environmental study findings are expected to be published in Autumn 2010 and the Government will consider, after the consultation period, if any changes to this assessment are required in light of those findings.

through disturbance of contaminated soils from excavation of subsurface structures and/or services, and changes to groundwater quality through spills and leaks. The impacts of discharges into the surrounding water body at Hinkley Point may therefore be exacerbated, such that adverse effects upon the integrity of adjacent European Sites, particularly for the Severn Estuary SAC, SPA and Ramsar and at the mouth of the River Wye and Usk SACs may occur.

- The implementation of the Welsh Water and Severn Trent Water Resources Management Plans may result in in-combination effects upon the Severn Estuary SAC, SPA and Ramsar sites and upon the River Wye and Usk SACs given that the strategies in place under these plans which aim to reduce current deficits (whereby demand is exceeding or forecast to exceed supply) may result in impacts upon those European Sites dependent upon water resources. The implementation of the Severn Trent Water Resource Management Plan would mean reliance upon additional flow augmentation to the River Severn during dry periods to minimise/avoid adverse environmental effects upon the Severn Estuary SPA, SAC and Ramsar site. In addition, the implementation of the Welsh Water Resource Management Plan states that “accurate assessment of exposure (and therefore vulnerability)”, of a European Site “can only be achieved through detailed studies in the RoC process, informed by the site knowledge of the CCW local teams and officers”³⁶. It therefore cannot be concluded that there will be no likely significant effect on the River Usk and Wye SAC if the Welsh Water Resource Management Plan is implemented.
- Development of a new nuclear power station at Oldbury may result in in-combination effects, if new nuclear power stations are built at both Oldbury and Hinkley Point. An assessment of these potential effects is included in the Habitats Regulations Assessment Main Report.

3.9 Given that water abstraction and discharge requirements and specific development locations for Hinkley Point are currently not defined, and that in-combination effects with other plans and projects are likely, a precautionary approach requires that at the strategic level potential adverse effects be assumed for the Severn Estuary SAC, SPA and Ramsar sites, and for the River Wye SAC and River Usk SAC in relation to water supply, quality and abstraction, until greater site specific detail (including on technology and mitigation measures) is known.

3.10 The potential for mitigation measures to effectively address the potential adverse effects on site integrity is considered further in the avoidance and mitigation section of this report.

Somerset Levels and Moors SPA, Ramsar

³⁶ Welsh Water (2008) HRA of the Draft Water Resource Management Plan. Available online: <http://www.dwrcymru.com/English/Company/Operations/resources/wrmp/index.asp>

- 3.11 The Somerset Levels and Moors SPA and Ramsar straddles Environmental Agency CAMS areas (Tone, Brue/Exe, and Parret). However, in each case the SPA and Ramsar areas are not covered by the Environment Agency management strategies because the water courses are not natural flowing rivers (they are managed using penning structures to minimise flood potential). Where abstractions and discharges occur that feed the designated area they are regulated in accordance with designated site conservation objectives.
- 3.12 Impacts on water quality at this site, which may have adverse effects for the qualifying species arise from local level management practices (for example, the Environment Agency note that while biological and chemical water quality in the area's rivers is typically high (89% and 87% respectively) nitrate pollutant levels in the water courses across the Somerset Levels and Moors in particular are high due to agricultural discharges)³⁷.
- 3.13 Recent surveys of the SPA's qualifying features and Ramsar criterion indicate that there has been a decline in the Annex 1 qualifying feature and Ramsar criterion (Bewick's Swan and Teal³⁸), with issues of land drainage and management practices implicated as a potential cause for the identified changes.
- 3.14 The available environmental condition and survey data suggests that observed effects on the qualifying features at the nominated site arise from a combination of local management practices (in particular drainage and land use issues). The data does not show any clear causal links between water quality/ flow changes beyond the immediate boundaries of the European designated sites (i.e. potential issues identified in the proximity of Hinkley Point) and the condition status of the qualifying interests.
- 3.15 **This strategic level assessment suggests that issues identified in relation to water resources and quality at Hinkley Point, are unlikely to have an adverse effect on site integrity on the Somerset Levels and Moors SPA and Ramsar sites.**

Habitat (and species) Loss and Fragmentation/ Coastal Squeeze

Severn Estuary SAC, SPA, Ramsar

River Wye SAC, River Usk SAC (Habitat (and species) Loss and Fragmentation only)

- 3.16 The Severn Estuary Coastal Habitat Management Plan (CHaMP)³⁹ produced by the Environment Agency⁴⁰ indicates that the Estuary is

37 Environment Agency (2008)/ State of the Environment, South West Regional Observatory.

38 British Trust for Ornithology (2008). The Wetland Bird Survey (WeBS) Alerts, Somerset Levels and Moors.

39 CHaMPs are specifically focused on the integrity of European sites.

40 The Severn Estuary Coastal Habitat Management Plan: Technical Summary (EA, 2006).

changing progressively. In particular, sea level rise is resulting in coastal squeeze and a net loss of intertidal habitat. Analysis indicates that the saltmarsh and mudflat/sandflat habitats around Hinkley Point (Habitat Behaviour Unit 1) will be subject to a net decrease over the next 20 years (decreases predicted to be 7% for the estuary as a whole). However, the area around Bridgwater Bay is also identified as a location where accretion may result in habitat extension and the CHaMP indicates that areas of currently undeveloped land around Hinkley Point may be suitable for intertidal habitat creation.

- 3.17 The current Shoreline Management Plan (SMP) (North Devon and Somerset) policy in front of and to the east of the existing power stations recommends 'holding the existing defence line' by maintaining the existing defences. However, the coastline immediately to the west of the existing stations consists of unprotected cliffs, which could be the subject of erosion. Information provided by the developer states that, if it is necessary to extend the defences westwards to provide further protection to the nominated site, it is envisaged that this could be done by the construction of new hard coastal defences. The developer also acknowledges that these works would be designed to secure the site against coastal erosion as well as providing the necessary degree of flood protection for the lifetime of the power plant at the nominated site.
- 3.18 The extent of loss of marine and terrestrial habitats likely from the construction of cooling water culverts, sea wall and a marine landing facility is currently unknown, and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features (saltmarsh and mudflat/sandflat habitats).
- 3.19 Long-term monitoring of fish at Hinkley Point B⁴¹ has shown that there has been a change in fish species composition; a greater number of warmer water species have been caught through impingement which indicates that the increase in temperature of the discharged waters from the nuclear power station has affected the species numbers and diversity within the Severn Estuary.

Effects in Combination with Other Plans and Projects

- 3.20 Aspects of the following plans and programmes could lead to "in combination" effects with regards to water resources and quality (see Appendix 2):
- The nominated site at Hinkley Point is included within Habitat Behavioural Unit 1: Hinkley Point to Brean Down of the Severn Estuary CHaMP. Habitats within this unit include intertidal mudflats, sandflats, saltmarsh, shingle and rocky shore, Atlantic salt meadows, estuaries, reefs and subtidal sandbanks. The

⁴¹ Hederson, P.A., and Seaby, R.M.H. (2001). Fish and crustacean captures at Hinkley Point B Nuclear Power Station; report for the year April 2000 to March 2001). Pisces Conservation Ltd.

CHaMP states that intertidal change for this unit is anticipated to be minimal over the next 20 years, with changes to habitat extent over the next 50 and 100 years likely to rise to 5-10% and 10-20% respectively. In addition, the habitats within this unit have been identified within the Severn Estuary CHaMP as being part of the total extent of habitat within Habitat Behavioural Unit 1 considered suitable for habitat creation and reclamation as part of future managed coastal retreat. The development is expected to require further coastal defence (thereby restricting landward migration of habitat)⁴², together with the additional loss and fragmentation of designated habitats, may therefore act cumulatively or accelerate changes identified by the CHaMP in relation to designated features of the Severn Estuary SAC, SPA and Ramsar sites, with the potential for adverse effects on site integrity.

- The short to medium term management options for the coastal defences along the coastal edge of the nominated site as determined within the Shoreline Management Plan (North Devon and Somerset) is to 'hold the line' (maintain, improve or construct sea defences to maintain the existing line of defences), such that local defences should be maintained, improved, or constructed to maintain the existing defences of the coastal sub-unit. However, the coastline immediately to the west of the existing stations consists of unprotected cliffs, which could be the subject of erosion. In-combination impacts may arise given that existing defences need to be extended westwards to provide further protection to the nominated site. The construction of additional sea defence infrastructure at Hinkley Point may therefore result in moving the line of defences seaward, equating to an 'advance the line' approach, a management option considered inappropriate within the SMP with regard to coastal processes or natural environment interests. Any alterations to the management of the coastline here could lead to coastal erosion issues upon sensitive shoreline habitats and species further along the coast, with potential impacts upon the integrity of the Severn Estuary European Sites.
- The Environmental Statement for the proposed Bristol Deep Sea Container Terminal⁴³ at Avonmouth and the estuary approach channel identifies further in-combination impacts upon the Severn Estuary European Sites in relation to habitat and species loss/fragmentation and coastal squeeze. Direct impacts include the loss of a small area of designated SPA and SAC habitat (approximately 2ha) arising from the reclamation of intertidal habitat, and the impacts of capital dredging within the estuary and disposal of its arisings upon the subtidal animal communities. Indirect impacts include the modification of local hydrodynamics and sediment transport leading to changes to the structure of intertidal mudflats as a result of accretion upstream within the Severn Estuary SPA and SAC sites.

42 <http://www.severnestuary.net/frms/docs/severn%20scoping%20report%20jan%2009%20v2.pdf>

43 Bristol Port Company (2008) Bristol Deep Sea Container Terminal Environmental Statement - Non Technical Summary.

- The Severn Tidal Power HRA preliminary screening report⁴⁴ identified the risk of a number of effects of the proposed tidal power generation schemes. These may have in-combination effects upon the Severn Estuary SAC, SPA, Ramsar and the River Wye and Usk SACs arising from possible impacts on habitat and species loss/fragmentation and coastal squeeze. Impacts include the direct permanent loss of habitat and associated species arising from the placement of the power generation infrastructure itself, and from alterations in the tidal range and flow upstream and downstream of the proposed barrage or lagoon. The final scheme chosen from those options currently being considered may also result in species mortality and/or the restriction of species movement and dispersal arising from the presence of additional physical barriers (sluices and turbines), with associated displacement of species and reduction in prey availability. Alterations to the extent of intertidal habitat through changes to sediment transport patterns arising from the barrage/lagoon structure may also cause the additional displacement of waterfowl. The Severn Tidal Power HRA preliminary screening report is not final and will be reviewed in the light of the feasibility study's findings. It covers all five options but does not distinguish between the individual options where impacts will vary⁴⁵.
- Decommissioning of Hinkley Point power stations A and B may also have in-combination effects with the proposed nuclear development at Hinkley Point relating to habitat and species loss and coastal squeeze at the Severn Estuary SAC, SPA and Ramsar site, and within the River Wye and Usk SACs. Deconstruction may result in the increase in loss of buffering and connecting habitat, whilst alterations to the extent of sensitive coastal habitats and associated species through additional sediment run-off and discharge loads may exacerbate habitat and species loss, particularly within the Severn Estuary European Sites due to their proximity to the existing nuclear power stations.
- Development of a new nuclear power station at Oldbury may result in in-combination effects, if new nuclear power stations are built at both Oldbury and Hinkley Point. An assessment of these potential effects is included in the Habitats Regulations Assessment Main Report.

3.21 Adverse effects on site integrity arising from habitat loss and coastal squeeze from the proposed development and from in-

44 DECC (2008) Severn Tidal Power HRA Preliminary Screening

45 The Department of Energy and Climate Change led a two year cross-departmental study to determine whether a tidal power project in the Severn Estuary could be supported. Within the study, a range of five different schemes were assessed, and the scope and scale of environmental, economic and social effects is likely to vary widely between them. Separate environmental studies into these impacts and whether they could be mitigated have been carried out. The assessment in this report is based upon the potential effects outlined in the habitats screening report for Severn Tidal Power. It covers all short-listed schemes but does not distinguish between the individual schemes where environmental impacts will vary. The Severn Tidal environmental study findings are expected to be published in Autumn 2010 and the Government will consider, after the consultation period, if any changes to this assessment are required in light of those findings.

combination effects of other plans and projects cannot be ruled out for the Severn Estuary SAC, SPA and Ramsar site and on the River Wye and River Usk SACs.

- 3.22 **The potential for mitigation measures to effectively address the potential likely adverse effects identified is considered further in the avoidance and mitigation section of this report.**

Disturbance (Noise, Light, Visual)

Severn Estuary SAC, SPA, Ramsar

River Usk SAC; River Wye SAC

- 3.23 Information produced by the Severn Estuary Partnership⁴⁶ for plan makers seeking to deliver infrastructure within the Severn Estuary area, indicates that the wading birds and wildfowl of the Estuary are particularly vulnerable to disturbance from close human proximity and the Screening Assessment noted the potential for construction and decommissioning phases in particular to create disturbance events. This may for example, occur from the construction activity itself which will increase both vehicular and human traffic, and mitigation measures such as the diversion of rights of way around Hinkley Point, resulting in greater or additional recreational pressures on bird nesting and foraging.
- 3.24 Site information for the Site of Special Scientific Interest (SSSI) units⁴⁷ underpinning the Severn Estuary SPA indicates that currently over 95% of the habitats supporting the interest feature species are in favourable condition, and this availability of habitat across the designation provides a strong foundation for species survival where displacement occurs. However, Hinkley Point lies directly adjacent to the SPA designation and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds reliant on specific/ individual areas of habitat, or to conclude that there will not be adverse effects on the site integrity of the Severn Estuary SPA.
- 3.25 The HRA Screening Assessment noted the potential for noise/vibration/light and disturbance such as fluctuating water levels or change in flow to affect the behaviour of migratory fish populations, in particular Twaite and Allis Shad. Seven species of migratory fish move through the Estuary between the sea and the rivers.
- 3.26 Adverse impacts upon fish species within the River Wye SAC and River Usk SAC may also occur given that some of the fish species designated within the Severn Estuary SAC are shared with the River Wye SAC and the River Usk SAC (Sea Lamprey, River Lamprey, Twaite Shad), such that any adverse impacts to their migratory and

46 The Habitats and Species of the Severn Estuary: A basic introduction for developers and decision makers. Severn Estuary Partnership.

47 Appendix 1. European Site Characterisations

reproductive behaviour arising near the source of the disturbance may be transferred between each of these three European Sites.

Effects in Combination with Other Plans and Projects

3.27 Aspects of the following plans and programmes could lead to “in combination” effects. See Appendix 2 for the full Plans and Programmes review.

- The Environmental Statement for the proposed Bristol Deep Sea Container Terminal⁴⁸ at Avonmouth and the estuary approach channel identifies impacts upon the qualifying features of the Severn Estuary European Sites in relation to disturbance, with activities during the construction process likely to impact upon the bird populations designated within the Severn Estuary SPA and Ramsar site and upon fish populations designated within the Severn Estuary SAC and Ramsar site and within the River Wye SAC.
- The Severn Tidal Power HRA preliminary screening⁴⁹ identified the risk of a number of effects of the proposed tidal range power generation schemes. These may have in-combination effects upon the Severn Estuary SAC, SPA, Ramsar sites arising from possible impacts such as noise, vibration and light pollution during construction and operation (gates, sluices, turbines and permanent lighting installations), and disturbance from electromagnetic fields generated from power transmission cables. The Severn Tidal Power HRA preliminary screening report is not final and will be reviewed in the light of the feasibility study's findings. It covers all five options but does not distinguish between the individual options where impacts will vary⁵⁰.
- Decommissioning of the existing power stations A and B at Hinkley Point may have in-combination effects with the proposed new nuclear development upon levels of disturbance within the Severn Estuary SAC, SPA and Ramsar site, and within the River Wye and Usk SACs. Deconstruction may result in the output of high levels of noise, vibration, visual and light disturbance, arising from increased vehicular use and demolition of buildings, increased noise and vibration from site clearance, treatment of wastes and blasting operations, and increase light pollution from additional traffic and clearance works.

48 Bristol Port Company (2008) Bristol Deep Sea Container Terminal Environmental Statement - Non Technical Summary.

49 DECC (2008) Severn Tidal Power HRA Preliminary Screening

50 The Department of Energy and Climate Change led a two year cross-departmental study to determine whether a tidal power project in the Severn Estuary could be supported. Within the study, a range of five different schemes were assessed, and the scope and scale of environmental, economic and social effects is likely to vary widely between them. Separate environmental studies into these impacts and whether they could be mitigated have been carried out. The assessment in this report is based upon the potential effects outlined in the habitats screening report for Severn Tidal Power. It covers all short-listed schemes but does not distinguish between the individual schemes where environmental impacts will vary. The Severn Tidal environmental study findings are expected to be published in Autumn 2010 and the Government will consider, after the consultation period, if any changes to this assessment are required in light of those findings.

- Development of a new nuclear power station at Oldbury may result in in-combination effects, if new nuclear power stations are built at both Oldbury and Hinkley Point. An assessment of these potential effects is included in the Habitats Regulations Assessment Main Report.
- 3.28 **Adverse effects on site integrity arising from disturbance levels (noise/vibration/ light/ visual) and from in-combination effects of other plans and projects cannot be ruled out at this strategic stage for the Severn Estuary SAC, SPA and Ramsar site and for the River Wye and River Usk SACs.**
- 3.29 **The potential for mitigation measures to effectively address the potential adverse effects on site integrity is considered further in the avoidance and mitigation section of this report.**

Air Quality

Severn Estuary SAC, SPA, Ramsar

- 3.30 Information collated by the South West Observatory 2008⁵¹ indicates that air quality in the south-west, including the area around Hinkley Point, is generally good with low levels of sulphur, nitrogen dioxide and particulates. Pollution levels for all key pollutants in the rural area around Hinkley Point are noted as typically low.
- 3.31 The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Environment Agency does not consider them to be an environmental priority. The Environment Agency's most recent available assessment of radioactive aerial emissions for regulated nuclear power stations and specifically for current generation at Hinkley Point indicates that all fall within authorised limits⁵².
- 3.32 Air quality issues around Hinkley Point are considered to be potentially most significant during construction and decommissioning phases (transport etc). The potential for cumulative effects from other plans and programmes (particularly local development plans delivering housing and economic growth) is minimised by sustainable transport measures set out in the Local Transport Plan, and the main focus of new housing and economic development being located to the east of the nearest main town Bridgwater which lies approx 13 km to the east of Hinkley Point.

51 <http://www.swo.org.uk/observatory/links-1/state/state-of-the-south-w-1.shtm>

52 Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005). http://maps.environment.agency.gov.uk/wiyby/queryController?topic=pollution&ep=2ndtierquery&lang=_e&layerGroups=1&x=321000.0&y=145900.0&extraClause=AUTHORISATION_ID~'AF7282'&extraClause=YEAR~2006&textonly=off&latestValue=&latestField=

Effects in Combination with Other Plans and Projects

- 3.33 Aspects of the following plans and programmes could lead to “in combination” effects (see Appendix 2):
- Decommissioning of the existing nuclear power stations A and B at Hinkley may also have in-combination effects with the proposed new nuclear development at Hinkley with regards to air quality and impacts upon adjacent European Sites, particularly should deconstruction of the existing site coincide with the construction phase of a new nuclear power station.
 - Deconstruction will likely result in the increase in dust emissions during excavations, demolition, and storage and handling of soils and materials, whilst increased vehicular usage will also contribute to this. Such impacts may potentially impact upon the Severn Estuary European Sites in particular, given their vicinity to these nuclear power stations.
- 3.34 **It is therefore considered in the context of known air quality conditions, existing plans and (local level) management activities to regulate air pollution impacts, and European Site characterisation data (which indicates that the qualifying features for the European Sites under consideration are not considered vulnerable or at risk for issues of air quality) that there are unlikely to be adverse effects on site integrity at designated sites from air quality impacts.**

Avoidance and Mitigation Measures

- 3.35 Avoidance and mitigation measures can apply both at a strategic policy level in the form of policy amendments/caveats, and in more detail at project level, where they are specific measures applicable to the identified issues at individual sites. This HRA is being undertaken at a strategic level where there are development uncertainties regarding the nature, scale and final footprint of the nominated site. These uncertainties limit the capacity of the HRA to reasonably predict the effects on a European Site⁵³.
- 3.36 At this strategic stage, the HRA for Hinkley Point can make avoidance and mitigation recommendations in relation to Hinkley Point to inform the strategic siting assessment process, and therefore the overall development of the NPS. These recommendations may also subsequently provide guidance to the IPC and potential future developers to ensure that any future development at Hinkley Point takes into account the findings of this strategic level assessment in a more detailed project-level HRA.
- 3.37 The HRA recommendations for avoidance and mitigation measures in relation to Hinkley Point are detailed below, and summarised in 4. Part II

⁵³ The key principles and any assumptions made in this plan level HRA of the Nuclear NPS and nominated sites are outlined in Part II of the HRA Report.

of the [main] HRA report also summarises the measures identified in this report alongside those proposed by [other] individual site HRAs.

- 3.38 This HRA is part of an ongoing assessment process that will continue with a detailed, project level HRA to be undertaken at development consent stage and informed by detailed information regarding the development plans at Hinkley Point including consideration of the impact on local defined habitats not covered by the HRA plan process,. Should project-specific findings during the undertaking of the project level HRA result in additional impacts arising which cannot be mitigated by the avoidance and mitigation measures recommended here, then changes to the development design may be required to ensure adverse effects on the integrity of the European Sites considered are adequately avoided. This could include changes to the scale and layout of the development, the technology applied, and/or alterations to the site boundary and location at Hinkley Point. Such changes required at the project level should be sufficiently flexible to ensure that all identified impacts are addressed.

Water Resources and Quality

- 3.39 Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010).
- 3.40 Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)⁵⁴ and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European Sites should not be permitted. In addition to the thermal effects from direct cooling, there are potential water quality issues, in particular nutrient enrichment from anti-fouling agents, which may be associated with the cooling water process.
- 3.41 The IPC, as guided by the NPS, can direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European Sites), are in place prior to site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments.
- 3.42 Direct cooling is the developer's preferred option for the cooling load for new nuclear development within the nominated site. This would require long cooling water culverts to reach deep water to obtain the coolest

⁵⁴ ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

water and to permit dispersion of the thermal plume to avoid and/or reduce any impacts on the qualifying species and habitats. To minimise the impact on the ecologically sensitive foreshore areas, it would be preferable to construct large culverts to avoid effects on the existing thermal regime of the Severn Estuary, including the use of modern tunnelling techniques for cabling and cooling water culverts where appropriate to avoid surface impacts and sedimentary processes, taking account of the length and design of intake/outfall structures. (The use of direct cooling would also minimise the visual impact on the Quantock Hills AONB.)

- 3.43 Adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.
- 3.44 However, if in the detailed studies carried out at local level it is found that there are significant environmental, technical or commercial limits to direct cooling, a suitable indirect cooling system would be developed.

Habitat (and species) Loss and Fragmentation/Coastal Squeeze

- 3.45 Any direct or indirect loss of habitats (temporary or permanent) arising from construction/operation or decommissioning will have the potential to have knock-on effects throughout the food chain (for example, the impacts on breeding and/or wintering birds and migratory fish) and development proposals for design and build should avoid any direct habitat impacts that may lead to a loss of species or fragmentation.
- 3.46 The use of modern tunnelling techniques for cabling and remote infrastructure, including cooling water culverts, where appropriate should be employed to ensure no surface impacts or adverse effects on sedimentary processes or thermal regime.
- 3.47 In terms of coastal erosion, should it be necessary to extend the sea defences to provide protection to the nominated site, it is envisaged that this could be done by the construction of new hard coastal defences and although the precise type and detail of the measures cannot be determined at this stage, the works on coastal defences would be designed to secure the site against coastal erosion and as well as provide the necessary coastal protection. It is therefore reasonable to conclude that a strategic level the new nuclear development within the nominated site could be protected against coastal erosion.
- 3.48 Connectivity of important wildlife corridors around the nominated site should be maintained, enhanced and restored. Management plans

should be in place and incorporated into the overall mitigation package as good practice. In addition, an ecological mitigation and management plan for the nominated site should link to existing integrated land management plans.

- 3.49 Avoiding adverse effects on fish species is in part influenced by the efficiencies achieved within the industrial process and the nature of the technologies proposed by developments (extent of cooling water requirements). Fish protection measures should be incorporated within cooling water intake/system design. There is, therefore, a role for the IPC to ensure that developments at Hinkley Point incorporate technologies and operating practices that take account of identified sensitivities in fish populations (breeding and feeding cycles) in particular in the estuarine environment around the proposed development.

Disturbance (Noise, Light, Visual)

- 3.50 The implementation of avoidance and mitigation measures aimed to reduce noise, vibration, light and visual disturbance arising from the development of the site and associated induced and ancillary infrastructure during construction, operation and decommissioning is required to ensure no adverse impacts upon the integrity of European Sites will occur. Mitigation measures should include:

- the requirement for technologies and operating practices which take account identified sensitivities in fish (particularly in relation to vibration impacts and low frequency noise) and bird populations (particularly in regard to the regularity of disturbance) in the estuarine environment to be implemented where practicable;
- the requirement to restrict encroachment of construction areas into sensitive habitats (particularly coastal habitat, and grassland to the east within the SPA) through site design;
- the requirement to implement appropriate screening of disturbance impacts arising during construction (and deconstruction) works;
- the requirement for the phasing and timing of development works which take into account breeding and feeding cycles and habitats, and the flight lines and migration routes of sensitive species including birds, fish and Otter;
- and the requirement for construction environmental management plans to be implemented at the site level which requires the management of disturbance impacts through appropriate avoidance or mitigation to ensure no adverse impacts upon site integrity will arise. There is also a role for the IPC to ensure that developments at Hinkley Point incorporate technologies and operating practices which take into account identified sensitivities of species in the estuarine environment around the proposed development at Hinkley Point.

3.51 The precise detail and the nature of the mitigation measures required would need to be agreed with relevant Statutory Bodies prior to any commencement of the development. Such mitigation measures would form part of the wider site management plan which requires agreement from developers to ensure their implementation prior to the commencement of any development works. Suitable avoidance, cancellation and reduction measures should be required and effectively implemented so as to ensure potential adverse effects on site integrity are avoided.

Air Quality

3.52 The assessment has noted that radioactive emissions from current nuclear power stations around Hinkley Point are low and are strictly controlled through regulation and the risk assessments undertaken for the consenting process. While air quality impacts are not assessed as being significant for the European Sites around Hinkley Point, it is appropriate that potential air quality impacts arising from developments are addressed.

3.53 Requirements should include:

- a need for management measures/ plans relating to emissions to be in place prior to site development, with decisions made taking into account BAT which ensure protection of the sensitivities of the receiving environments;
- a requirement for all recommendations for mitigation and avoidance within management plans to take into account the potential for cumulative impacts where phasing between the existing power station and the new build overlaps;
- a requirement to seek opportunities to offset emissions where appropriate; the requirement for radioactive emissions to be ALARA with non-radioactive emissions expected to be an improvement upon existing standards;
- and the requirement that any emissions which lead to adverse effects on the integrity of European Sites will not be permitted by the relevant regulatory authority.

Table 4: Summary of Avoidance and Mitigation Recommendations

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
Water Resources and Quality	
<ul style="list-style-type: none"> • Water Quality 	<ul style="list-style-type: none"> • Direct requirements for the protection of water quality. This may include requiring that management measures relating to supply and discharge are in place prior to the implementation of the nominated site proposals, and that decisions relating to BAT take specific account of the sensitivities of the individual receiving environments. • Thermal, radioactive and non-radioactive discharges should go beyond complying

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
	<p>with existing standards, with radioactive discharges required to be ALARA and all other discharge levels required to be an improvement on existing standards.</p> <ul style="list-style-type: none"> • Discharges (thermal or otherwise) which lead to adverse effects on the integrity of European Sites should not be permitted. • Design cooling water culverts to avoid effects on the existing thermal regime of the Severn Estuary, such as through the use of modern tunnelling techniques for cabling and cooling water culverts where appropriate to avoid surface impacts • Ensure careful design of cooling water culverts to avoid, reduce or mitigate adverse effects on sedimentary processes or thermal regime, taking account of route, length and design of intake/outfall structures.
<ul style="list-style-type: none"> • Water Quantity 	<ul style="list-style-type: none"> • Direct the selection of appropriate construction methods which minimise impacts of the development upon water resources. • Direct requirements for the efficiency of water use. • Ensure that volume of cooling water returned to Estuary within capacity of immediate receiving environment and does not adversely affect sediment flow
<ul style="list-style-type: none"> • Surface and Groundwater Flow 	<ul style="list-style-type: none"> • Require suitable design to be implemented including the use of Sustainable Drainage Systems (SuDS). • Require suitable design within abstraction mechanisms to ensure potential impacts upon groundwater flow are avoided.
Habitat (and species) Loss and Fragmentation/ Coastal Squeeze	
<ul style="list-style-type: none"> • Direct Habitat Loss 	<ul style="list-style-type: none"> • Require site layout/ design to avoid areas of known importance or sensitivity and to mitigate (temporary) habitat and species losses. • Require the maintenance, enhancement and restoration to the connectivity of important wildlife corridors around the site. Management plans should be in place and incorporated into the overall mitigation package as good practice, and should link to existing integrated land management plans.

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
<ul style="list-style-type: none"> Loss of Surrounding Habitat (construction of associated infrastructure) 	<ul style="list-style-type: none"> Design cooling water culverts to avoid effects on the existing thermal regime of the Severn Estuary, through the use of modern tunnelling techniques for cabling and cooling water culverts where appropriate to avoid surface impacts. Ensure careful design of cooling water culverts to avoid, reduce or mitigate adverse effects on sedimentary processes or thermal regime, taking account of route, length and design of intake/outfall structures. Require ecological mitigation and management plans to link to existing land and coastal management plans.
<ul style="list-style-type: none"> Barriers to Migration for Fish and Birds 	<ul style="list-style-type: none"> Screening of works areas, include height restrictions where necessary to limit disturbance and impacts on migratory paths. Require the incorporation of fish protection measures within cooling water intake/system design.
Disturbance (Noise, Light, Visual)	
<ul style="list-style-type: none"> Increased noise/vibration, light and visual disturbance arising from development of the site and of associated induced and ancillary infrastructure through construction, operation and decommissioning 	<ul style="list-style-type: none"> Direct requirements for technologies and operating practices which take account of identified sensitivities in fish and bird populations in the estuarine environment. Restrict encroachment of construction areas into sensitive habitats through site design. Require the visual/noise screening of construction (and deconstruction) works. Require the phasing and timing of development works which take into account breeding and feeding cycles and habitats, and flight lines and migration routes of sensitive species including birds, fish and Otter. Require construction environmental management plans to be implemented at the site level which aim to avoid or mitigate against impacts of disturbance to ensure no adverse impacts upon site integrity.
Air Quality	
<ul style="list-style-type: none"> Increased development/traffic growth and increased release of dust and particulates arising from construction, operation 	<ul style="list-style-type: none"> Require sustainable transport plans which include the use of non-road transport where possible. Require that the development is phased to minimise emissions and dust generation. Promote the use of carbon-efficient forms of

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
and decommissioning	<p>transport and construction during the power station lifecycle.</p> <ul style="list-style-type: none">• Support opportunities to offset emissions as appropriate.• Ensure that appropriate air quality management plans are in place, with recommendations for mitigation and avoidance taking into account the potential for cumulative impacts where phasing between the existing power station and the new build overlap such that no adverse impacts upon site integrity will occur.

Summary of HRA Findings and Recommendations

- 3.54 The HRA Screening Assessment identified the likely significant effects on four European Sites as a result of impacts that may arise from the development of a nuclear power station at the nominated site. These effects were assessed further through the AA stage of the HRA which considered: European Site data; available environmental condition data; and the potential effects of other plans and projects ‘in-combination’; in coming to a conclusion on the likelihood that the development of the nominated site will have an adverse effect on European Site integrity.
- 3.55 Based on HRA experience, professional judgement, and the consultation advice received from the Statutory Consultees, it is reasonable to conclude that the suggested measures may be sufficient to avoid and/ or mitigate the adverse effects on the integrity of European Sites identified. However, the effectiveness of the measures proposed can only be ascertained with certainty through HRA at a project level, where the specific details of developments and primary data sources will be available.
- 3.56 The conclusions of the HRA are limited by the strategic nature of the assessment process and the information available, which does not allow for a definitive prediction of effects on the European Sites considered. A precautionary approach suggests that AA at this strategic level cannot rule out the potential for adverse effects on the integrity of five European Sites (the Severn Estuary SAC, SPA, Ramsar and the River Wye SAC and the River Usk SAC) through impacts on water resources and quality, habitat and species loss and fragmentation/ coastal squeeze and disturbance (noise, light and visual).
- 3.57 Table 5 below illustrates those sites where adverse effects on site integrity arising from the development cannot be ruled out.

Table 5: Summary of Appropriate Assessment

Potential Effects Arising from Development	European Sites at which adverse effects cannot be ruled out
Water resources and quality	<ul style="list-style-type: none"> • Severn Estuary SAC, • Severn Estuary SPA • Severn Estuary Ramsar • River Wye SAC • River Usk SAC
Habitat (and species) loss and fragmentation	<ul style="list-style-type: none"> • Severn Estuary SAC, • Severn Estuary SPA • Severn Estuary Ramsar • River Wye SAC • River Usk SAC
Coastal Squeeze	<ul style="list-style-type: none"> • Severn Estuary SAC, • Severn Estuary SPA • Severn Estuary Ramsar

Disturbance (noise, light, visual)	<ul style="list-style-type: none"> • Severn Estuary SAC, • Severn Estuary SPA • Severn Estuary Ramsar • River Wye SAC • River Usk SAC
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3.58 To address the uncertainties inherent in a strategic level HRA, the AA has proposed a suite of avoidance and mitigation measures to be considered as part of any project level HRA (Table 4). At this stage, it is assessed that the effective implementation of these strategic mitigation measures may help to address the identified adverse effects on European Site integrity, but that more detailed project level HRA is required in order to draw conclusions on their efficacy.

3.59 Further assessment supported by detailed data at the project level will be required before it can be concluded that nuclear power development at this nominated site can be undertaken without adversely impacting upon the integrity of the European Sites at Hinkley Point.

3.60 Therefore, only at the project level HRA can a conclusion of no adverse effect on site integrity be made with any confidence.

Glossary

AA	Appropriate Assessment
ALARA	As Low As Reasonably Achievable
AoS	Appraisal of Sustainability
APIS	UK Air Pollution Information System
BAT	Best Available Technology
DECC	Department for Energy and Climate Change
CAMS	Catchment Abstraction Management Strategy
CCW	Countryside Council for Wales
CHaMPs	Coastal Habitat Management Plans
EA	Environment Agency
EIA	Environmental Impact Assessment
FRMS	Flood Risk Management Strategy
HRA	Habitats Regulations Assessment
ICZM	Integrated Coastal Zone Management
IPC	Infrastructure Planning Commission
LA	Local Authority
LDF	Local Development Framework
LSE	Likely Significant Effect
LTP	Local Transport Plan
NE	Natural England
NPS	National Policy Statement
PP	Plans and Projects
pSPA	Potential Special Protection Area
Ramsar	Wetland Sites designated by the Ramsar Convention
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SPA	Special Protection Area
SSA	Strategic Siting Assessment
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
WC	Water Companies
WRMU	Water Resource Management Unit

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