

Habitats Regulations Assessment: Site Report for Heysham

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 Heysham.

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.

Contents

| | | |
|----------|--|-----------|
| 1 | Introduction..... | 6 |
| | This HRA Report..... | 6 |
| | The revised draft Nuclear National Policy Statement..... | 6 |
| | HRA Process | 7 |
| 2 | HRA Screening of Heysham | 10 |
| | Screening..... | 10 |
| | European Site Identification and Characterisation | 10 |
| | Nominated Site Review and Identification of Likely Impacts..... | 11 |
| | Identification and Consideration of Other Plans, Programmes and Projects..... | 12 |
| | Screening Assessment..... | 13 |
| | Water Resources and Quality Impacts | 13 |
| | Habitat (and Species) Loss and Fragmentation..... | 15 |
| | Coastal Squeeze | 16 |
| | Disturbance (Noise, Light and Visual)..... | 17 |
| | Air Quality Impacts..... | 18 |
| | Conclusions and Recommendations | 20 |
| 3 | HRA Appropriate Assessment of Heysham | 22 |
| | Scoping and Additional Information Gathering..... | 22 |
| | Assessing the Impacts (in-combination) Appropriate Assessment | 22 |
| | Water Resources and Quality | 22 |
| | Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze..... | 25 |
| | Disturbance (Noise, Light, Visual)..... | 27 |
| | Air Quality | 29 |
| | Avoidance and Mitigation Measures | 31 |
| | Water Resources and Quality | 32 |
| | Habitat (and Species) Loss and Fragmentation/Coastal Squeeze..... | 32 |
| | Disturbance (Noise, Light, Visual)..... | 32 |
| | Air Quality | 33 |
| | Summary of HRA Findings and Recommendations..... | 35 |
| | Glossary..... | 38 |

List of Tables

Table 1: Habitats Regulations Assessment: Summary Overview of Key Stages 8
Table 2: European Sites within 20 km of the nominated site 11
Table 3: Summary of Likely Significant Effect Screening 21
Table 4: Summary of Avoidance and Mitigation Recommendations 33
Table 5: Summary of Appropriate Assessment 36

List of Figures

Figure 1 Location Plan
Figure 2: Plan showing European Designations in relation to nominated site

Appendices

1 European Site Identification and Characterisation
2 Plans and Programmes Review
3 Likely Significant Effects Screening
4 Appropriate Assessment Proforma

1 Introduction

This HRA Report

- 1.1 This report sets out the HRA Screening and Appropriate Assessment components of the Habitats Regulations Assessment (HRA) of the proposals for Heysham. This site was nominated into the Strategic Sites 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) published for public consultation in Autumn 2009. 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. 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 Commission¹ for development consent to develop new nuclear power stations at those sites.
- 1.3 Each development consent for new nuclear power stations will need to be accompanied by a project level HRA report, alongside an Environmental Statement reporting the findings of a detailed Environmental Impact Assessment (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 by 2025, and the framework by which development consent decisions on sites should be made, by the Infrastructure Planning Commission.

¹ 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 Directive² protects habitats and species of European nature conservation importance. Together with the Birds Directive³, 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 also designated under the Ramsar Convention 1971, and the UK Government policy states that the Ramsar sites and potential SPAs are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them⁴. These sites combine to create a Europe-wide 'Natura 2000' network of European Sites, which are hereafter referred to as 'European Sites'⁵ in this and other HRA reports⁶. Potential SACs⁷ are also considered within this assessment.
- 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

2 Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML>

3 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>

4 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

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

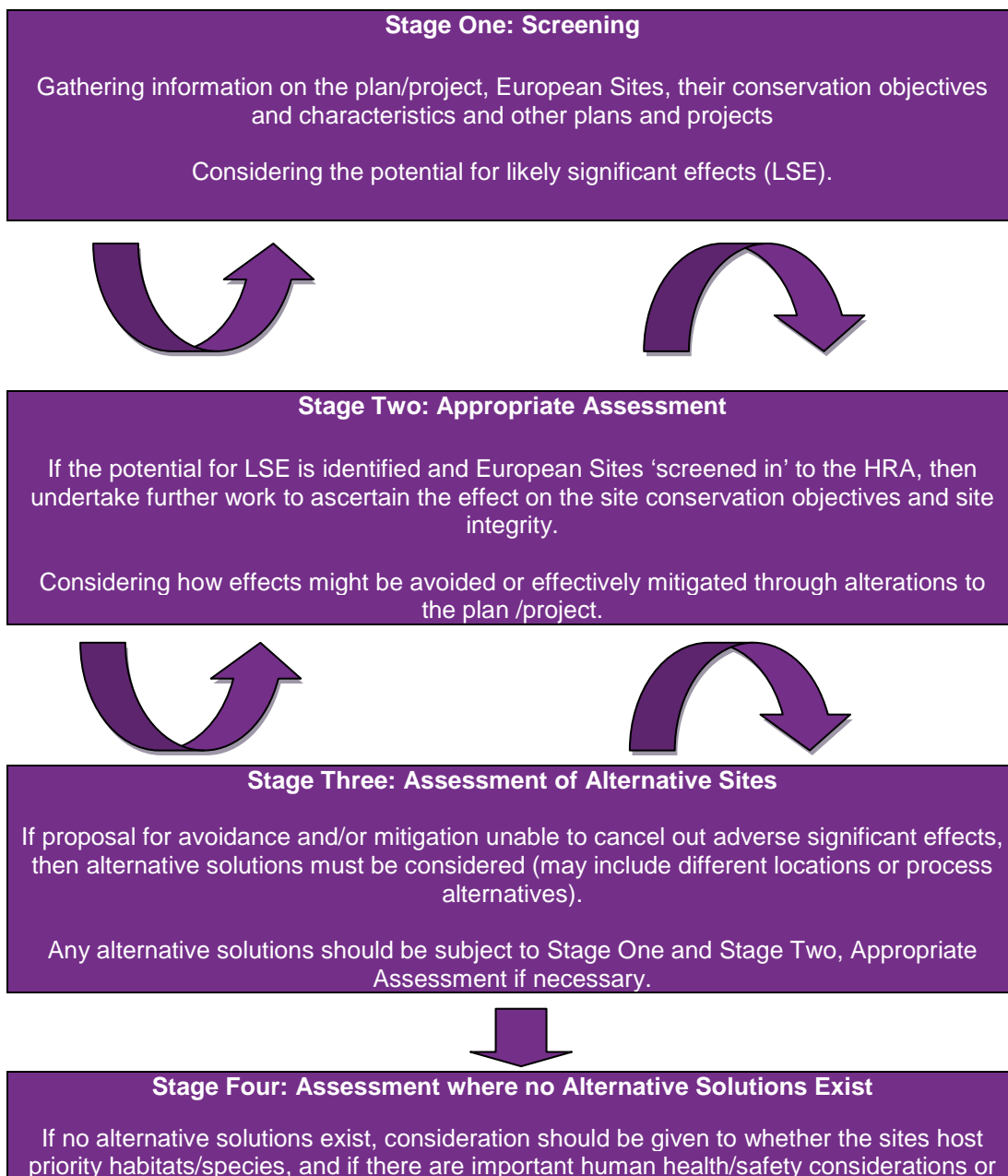
6 The term European Site is used throughout all the Site HRA Reports and in the Main HRA Report, and incorporates SACs, SPAs, SCIs and Ramsar sites.

⁷ Potential (or possible) SACs (sites which have not yet been submitted to the European Commission as a cSAC) are not defined as European sites (ODPM Circular 06/2005 advises that the Habitats Regulations do not apply as a matter of law or policy), but ODPM Circular 06/2005 advises that, nevertheless, planning authorities should take note of this potential designation in their consideration of any planning application that may affect a pSAC. Candidate SACs/SPAs are sites which have been submitted to the European Commission (EC) for inclusion in the Natura 2000 network and are now legally protected.

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

revised draft Nuclear NPS and nominated sites, are outlined in Part II of the HRA Report. This report covers the Screening Assessment and Appropriate Assessment (AA) stages of the HRA for the nominated site at Heysham, as outlined in Table 1. It takes into account the information contained within the site nomination submitted to Government by the nominator (EDF Energy)⁹. The HRA process is typically iterative and assessments have been revised on the basis of commentary from the Statutory Consultees.

Table 1: Habitats Regulations Assessment: Summary Overview of Key Stages¹⁰



⁹ www.energynpsconsultation.decc.gov.uk

¹⁰ Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article6(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

important environmental benefits from delivering the plan.

If Imperative Reasons of Overriding Public Interest (IROPI) are determined, then compensatory measures must be designed, assessed and put in place, prior to the commencement of the plan.

2 HRA Screening of Heysham

- 2.1 The nominated site¹¹ is an area of approximately 115 hectares, located to the east of Heysham nuclear power stations 1 and 2 on the Lancashire coast at the south of Morecambe Bay, 8 km west of Lancaster. 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 the European Site[s]. This is essentially a risk assessment process that seeks to understand whether there are mechanisms for any 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 HRA screening process for Heysham are described below.

European Site Identification and Characterisation

- 2.4 European Sites within a 20 km radius of the nominated site were scoped into the HRA screening process as set out in Table 2 and Figure 2. This area of search reflects guidance recommendations¹³, 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. It should be noted that an area of land can be covered by more than one European designation.

¹¹ as proposed through the nominations process

¹² Appropriate Assessment of Plans (Therivel, May 2008)

¹³ Communities and Local Government (2006) Planning for the Protection of European Sites: Appropriate Assessment – Guidance for Regional Spatial Strategies and Local Development Documents.

Table 2: European Sites and possible European Sites within 20 km of the nominated Site

| | Designation | Distance from nominated site ¹⁴ |
|---------------------------|------------------------|--|
| Bowland Fells | SPA | 13 km |
| Calf Hill and Cragg Woods | SAC | 14 km |
| Leighton Moss | SPA | 17 km |
| Leighton Moss | Ramsar | 17 km |
| Liverpool Bay | SPA | 19 km |
| Morecambe Bay | SAC | Partly within and adjacent |
| Morecambe Bay | SPA | Partly within and adjacent |
| Morecambe Bay | Ramsar | Partly within and adjacent |
| Morecambe Bay Pavements | SAC | 18 km |
| Shell Flat and Lune Deep | cSAC & pSAC | 19 km and 15km |

2.5 **Appendix 1** details the characteristics of the ten European Sites (and one pSAC) 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 nominator's report¹⁵ states that the operational footprint is likely to be between 30-50 hectares, that it is anticipated that the main part of the development would be in the south-west part of the site, and that it will be necessary to construct cooling water infrastructure, and possibly also coastal defences and (construction phase) marine off-loading facilities beyond the nominated site boundary. The developer was not required to provide details of the proposed development at this stage.

2.7 From the nomination documents¹⁶ it is assumed that the nomination is for a nuclear power station development, incorporating:

¹⁴ Distance measured is from nearest boundary

¹⁵ Site Nomination Report For Heysham, EDF Energy, 2009; nomination documents submitted by EDF Energy, at <http://www.nuclearpowersiting.decc.gov.uk/nomination/heysham/>

¹⁶ Op cit.

- at least one nuclear reactor;
 - Construction areas and facilities, including a Marine Off-Loading Facility;
 - Infrastructure and facilities related to the operation of a nuclear power station, such as transmission infrastructure and coastal protection measures;
 - Cooling water infrastructure, including cooling water intake and outfall structures;
 - 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 outlined and discussed in Part II of the HRA Report. Impacts of particular relevance to this nominated site include: direct habitat loss (including coastal squeeze), fragmentation and disturbance, and effects water and air quality. 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, programmes 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 process should take account of reasonably foreseeable impacts (as opposed to every conceivable effect).¹⁷
- 2.11 For the purposes of this assessment consideration was given to:
- Local Development Plans delivering planned spatial growth
 - Major Development Schemes (including transport plans/ airport expansion) where relevant
- 2.12 Where relevant, reference was also made to:
- Transport Plans
 - Shoreline Management Plans
 - Minerals and Waste Development Frameworks

¹⁷ Tyldesley, D. (2009) Habitats Regulations Assessment of Local Development Documents. Revised Draft Guidance for Natural England. Natural England, Sheffield.

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

Screening Assessment

- 2.14 The following sections outline the issues arising from the Screening Assessment (LSE test) undertaken at **Appendix 3**, for Heysham. The Screening Assessment indicated that development at Heysham 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)**
- **Air Quality**

- 2.15 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):

- Bowland Fells SPA
- Liverpool Bay SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Calf Hill and Cragg Woods SAC
- Leighton Moss SPA, Ramsar
- Morecambe Bay SAC, SPA, Ramsar

- 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 from toxic compounds (that may also bind to sediments) can lead to death of aquatic life and increase 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 Screening Assessment identified the potential for impacts on water resources and quality arising from the construction, operation and decommissioning phases of the nominated site. Issues include: increased/ altered drainage from earthworks and excavations; the potential for toxic contamination from accidental leakage; radioactive

discharges to water (both accidental and routine); alteration of flow through abstraction; and changes to water temperature from controlled discharge.

- 2.18 Of the ten European Sites screened, six sites were identified as possessing specific vulnerabilities relating to the water resource (Calf Hill and Cragg Woods SAC; Leighton Moss SPA/Ramsar and Morecambe Bay SAC/SPA/Ramsar).

Calf Hill and Cragg Woods SAC

- 2.19 Calf Hill and Cragg Woods SAC is vulnerable to lowering of the water table through water abstraction (see Appendix 1). The effects of this could include a transition of the designated ash/alder woodland community to a drier unfavourable woodland type (as defined against conservation objectives).
- 2.20 The nominated site is 14 km to the east of Calf Hill and Cragg Woods SAC and within the same river basin district (Lune)¹⁸. **The Screening Assessment indicates that the potential for significant impacts on this European Site is uncertain and, taking a precautionary approach should be considered further through Appropriate Assessment.**

Leighton Moss SPA, Ramsar

- 2.21 Leighton Moss SPA/Ramsar is partially designated for populations of Marsh Harrier *Circus aeruginosus*. This site is less than 1 km from Morecambe Bay and supports suitable hunting grounds for Marsh Harriers. Should water quality impacts within Morecambe Bay arise as a result of construction, operation or decommissioning of the nominated site there is the potential for indirect impacts upon the Marsh Harrier populations through accumulation of toxins within the food chain. **This issue should be considered further through Appropriate Assessment at this European site to determine the nature and extent of the potential significant effects identified.**

Morecambe Bay SAC, SPA, Ramsar

- 2.22 Morecambe Bay SAC is vulnerable to changes in sediment flows, toxic and non toxic contamination, changes in turbidity, salinity, oxygen levels and temperature, which could result from earthworks, infrastructure provision, planned and accidental discharges of

¹⁸ Environment Agency River Basin Management Plans: Draft North West River Basin District, February 2009

radioactive and non-radioactive material, from the abstraction and discharge of water for cooling.

- 2.23 For example, toxins can bind to sediments and bio-accumulate in salt marsh plants, changes in water quality and of water temperature can impact on species composition/encourage excessive algal growth, biocides used to clean cooling infrastructure could potentially affect the status of habitats, and localised abrasion of habitats can occur around discharge/abstraction points.
- 2.24 Increased nutrient input which could result at construction, operation or decommissioning, through earthworks, altered sediment flows, deposition from planned or accidental aerial releases (including releases of nitrogen oxide) could affect species composition and structure of supporting habitats for the SPA/Ramsar interest features and cause indirect effects as a result of changes to the availability and quality of food sources. Changes in sediment regimes and increased turbidity/siltation could result in mortality of filter feeding shellfish, upon which many of the SPA/Ramsar qualifying species feed (for example, Knot *Calidris canuta*, for which molluscs are an important food source). Similarly intertidal habitats may be affected through smothering through an altered sediment regime. For example, eelgrass beds, which are an important feeding ground for Wigeon, are highly vulnerable to smothering by suspended sediments. This may cause reductions in prey items and food sources for waterfowl and waders. Any release of toxins into the bay could also impact on important bird species and assemblages of the SPA/Ramsar through accumulation within the foodchain.
- 2.25 **The nominated site is partly within Morecambe Bay SAC/SPA/Ramsar and the Screening Assessment indicates that the potential for significant impacts on these European 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):

- Calf Hill and Cragg Woods SAC
- Liverpool Bay SPA
- Leighton Moss SPA, Ramsar
- Bowland Fells SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Morecambe Bay SAC, SPA, Ramsar

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

Morecambe Bay SAC, SPA, Ramsar

2.27 The necessary construction of cooling water intake and outfall structures and the possible construction of coastal defences and marine off-loading facilities within Morecambe Bay SAC / SPA / Ramsar could result in the direct loss of designated and supporting habitats. Habitat could also be lost indirectly, for example through interruption of sediment flows, via the installation of the above infrastructure. Any loss of designated habitats (for example intertidal habitats) or habitats that support designated bird species (for example vegetated shingle habitat that provides roosting habitat for Little Terns *Sterna albifrons*) could be considered significant. **The potential for adverse effects on the European Sites integrity should be considered further through Appropriate Assessment.**

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

- Calf Hill and Cragg Woods SAC
- Liverpool Bay SPA
- Leighton Moss SPA, Ramsar
- Bowland Fells SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Morecambe Bay SAC, SPA, Ramsar

2.28 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.

Morecambe Bay SAC, SPA, Ramsar

- 2.29 Construction of infrastructure that encroaches on the coastal fringe at the nominated site may lead to coastal squeeze and result in the loss of inter-tidal habitats directly in front of coastal defence and other such structures which prevent the natural migration of the coastal margin inland. Any loss of designated habitat within Morecambe Bay SAC or habitat that supports the designated bird species of Morecambe Bay SPA/Ramsar could be considered significant.
- 2.30 **The impacts of coastal squeeze should 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):

- Calf Hill and Cragg Woods SAC
- Liverpool Bay SPA
- Leighton Moss SPA, Ramsar
- Bowland Fells SPA
- Morecambe Bay SAC
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Morecambe Bay SPA, Ramsar
- 2.31 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 vibration¹⁹.

Morecambe Bay SPA, Ramsar

- 2.32 Morecambe Bay SPA and Ramsar have year round bird interest, as they are designated for supporting 48 species (see Appendix I) of breeding, overwintering and on passage birds. Breeding and overwintering birds 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 habitats²⁰. The net effect of these disturbance events is a direct negative impact on species survival.
- 2.33 The Screening Assessment identified disturbance as being one of key vulnerabilities that affects site integrity for Morecambe Bay SPA/Ramsar. Increased disturbance is likely from a range of sources (lighting, noise and vibration) during construction, operation and decommissioning, 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.
- 2.34 **Given the proximity of the nominated site to Morecambe Bay SAC/SPA/Ramsar and identified sensitivities of the designated species to disturbance events, the potential for adverse effect should be considered further through Appropriate Assessment.**

Air Quality Impacts

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

- Calf Hill and Cragg Woods SAC
- Liverpool Bay SPA
- Leighton Moss SPA, Ramsar
- Bowland Fells SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

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

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

- Morecambe Bay SAC, SPA, Ramsar
- 2.35 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.
- 2.36 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.
- 2.37 The HRA Screening Assessment noted the potential for impacts on air quality at a local level. These impacts are considered to arise in particular from the construction and decommissioning processes (for example, fugitive dust and airborne particulates). Increased traffic generation is also of concern during development phases, and major roads within 200m have the potential to increase nitrogen and carbon emissions impacts from vehicles²¹.
- 2.38 The Screening Assessment also noted the potential for radioactive releases to the atmosphere, but that regulatory sources indicate aerial (radioactive) emissions to be low (they had declined by 76% between the highest levels recorded in 1985 and 2003) and cause little human and biodiversity radiation exposure²². Non-radioactive releases from the nuclear sector (which include CO₂, SO₂, NO_x and VOCs) are extremely low compared to the total from other industries which the EA regulate, and hence the Environment Agency do not consider them to be an immediate environmental priority.

Morecambe Bay SAC, SPA, Ramsar

- 2.39 The HRA Screening Assessment identified that habitats (perennial vegetation of stony banks, atlantic salt meadows, humid dune slacks, dunes with *salix repens* spp. *Argentea* (*Salicion arenariae*)) within Morecambe Bay SAC are vulnerable to air pollution. In particular nutrient deposition on many sand dunes throughout the UK is already

²¹ Department for Transport (2003) Transport Analysis Guidance, the Local Air Quality Sub-Objective TAG Unit 3.3.3.

²² Environment Agency (2005) Measuring Environmental Performance, Sector Report for the Nuclear Industry.

above its critical threshold for impacts on vegetation.^{23 24} The consequence of this for dune slacks, is a tendency to a speeded up succession away from dune slack vegetation. Also shingle communities are vulnerable to smothering from airborne particulates and as a consequence may suffer reduced rates of growth.

- 2.40 The potential for resulting changes to the vegetation structure and composition could also result in impacts on the designated bird species of the SPA and Ramsar that depend on them for foraging, roosting and nesting. For example Little Terns require short, open vegetation within shingle communities, and this could be affected through eutrophication from air pollution. **The potential for adverse effects on these European Sites should be considered further through Appropriate Assessment.**

Conclusions and Recommendations

- 2.41 In line with the screening requirement of the Habitats Directive and Regulations, an assessment was undertaken to determine the likely significant-effects of the proposed development at Heysham on the ten European Sites (and one pSAC) that lie within 20km of the nominated site. The Screening Assessment and conclusions were informed by:
- The information gathered on the European Sites – **Appendix 1**;
 - The summary analysis of potential environmental impacts generated by the development activities arising from the nominated site – **Appendix 3**;
 - Consideration, where necessary, of other plans and programmes that have spatial/ contextual relevance – **Appendix 2**
 - Government guidance²⁵ which indicates that HRA for plans is typically broader and more strategic than project level HRA and that it be undertaken at a level that is proportionate to the available detail of the plan.
- 2.42 The HRA Screening Assessment identified a number of key impacts arising from the development of the nominated site and the potential for significant effects at six of the European Sites scoped into the HRA screening process. These findings are summarised in Table 3 below.

23 Jones, M.L.M. *et al.* 2002. Changing nutrient budget of sand dunes: consequences for the nature conservation interest and dune management CEH, Bangor.

24 Jones, M.L.M. *et al.* 2004. Changes in vegetation and soil characteristics in coastal sand dunes along a gradient of atmospheric nitrogen deposition *Plant Biology* 6, 598-605.

25 "Planning for the Protection of European Sites: Appropriate Assessment - Guidance For Regional Spatial Strategies and Local Development Documents",
<http://www.communities.gov.uk/archived/publications/planningandbuilding/planning2>

Table 3: Summary of Likely Significant Effect Screening

| European Sites within 20 km of the nominated site at Heysham | Water Resources and Quality | Habitat Loss and Fragmentation | Coastal Squeeze | Disturbance (Noise, Light, Visual) | Air Quality |
|--|-----------------------------|--------------------------------|-----------------|------------------------------------|-------------|
| Bowland Fells SPA | X | X | X | X | X |
| Calf Hill and Cragg Woods SAC | ? | X | X | X | X |
| Liverpool Bay SPA | X | X | X | X | X |
| Leighton Moss SPA | ✓ | X | X | X | X |
| Leighton Moss Ramsar | ✓ | X | X | X | X |
| Morecambe Bay Pavements SAC | X | X | X | X | X |
| Morecambe Bay SAC | ✓ | ✓ | ✓ | X | ✓ |
| Morecambe Bay SPA | ✓ | ✓ | ✓ | ✓ | ✓ |
| Morecambe Bay Ramsar | ✓ | ✓ | ✓ | ✓ | ✓ |
| Shell Flat cSAC and Lune Deep pSAC | X | X | X | X | X |

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

2.43 It is recommended that the HRA proceeds to the next stage of 'Appropriate Assessment' in relation to the six European Sites where the potential for likely significant effects (✓) or significant effect uncertain (?) has been identified.. This next stage of the HRA process is outlined in section 3 of this report.

3 HRA Appropriate Assessment of Heysham

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 Assessment. This additional information included air quality data and trends, available from the UK Air Pollution Information System (APIS); water quality and abstraction data produced by the Environment Agency; RSPB and CEH published articles/papers; and Natural England SSSI condition assessments.

Assessing the Impacts (in-combination) Appropriate Assessment

- 3.2 The HRA Screening Assessment considered whether the impacts arising from the development of the nominated site have the potential to affect the integrity of the European Sites scoped into the assessment process. The following sections summarise the analysis undertaken 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. This was done by making an assessment against the conservation objectives for each European Site (see Appendix 1).

Water Resources and Quality

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

- Bowland Fells SPA
- Liverpool Bay SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Calf Hill and Cragg Woods SAC
- Leighton Moss SPA, Ramsar
- Morecambe Bay SAC, SPA, Ramsar

Leighton Moss SPA, Ramsar

Morecambe Bay SAC, SPA, Ramsar

- 3.3 Current Environment Agency²⁶ data has not assessed the ecological status (or ecological potential) in Morecambe Bay. Chemical status of Morecambe Bay was recorded as 'failing to meet good' around the nominated site and as 'good' around the estuary at Arnside. Groundwater quantity and chemical quality around the nominated site are assessed as being 'good' and 'poor' respectively.
- 3.4 Environmental condition information for Morecambe Bay SAC, SPA and Ramsar indicate that designated habitats of the SAC and supporting habitats of the SPA and Ramsar are vulnerable to toxic contamination, increased/ altered drainage from earthworks and excavations, alteration of flow from abstraction, changes to water temperature from controlled cooling water discharges, and sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases (Appendix 1, Site Characterisations).
- 3.5 The potential for toxic and radioactive discharges at Morecambe Bay may also affect the Marsh Harrier populations for which Leighton Moss SPA and Ramsar are designated, through the accumulation of toxins within the food chain.
- 3.6 Current water quality data for the site suggests that there are some existing sources of pollution affecting the chemical status of Morecambe Bay and as such habitats and dependent species within these designated sites are already likely to be under pressure from poor chemical quality of water within the estuary.
- 3.7 The water resource management unit (WRMU)²⁷ around the nominated site is not managed through the Environment Agency Catchment Abstraction Management Strategy process due to its tidal nature. The nearest connecting WRMU to the nominated site is WRMU 1 (Lower Lune) has a "high" sensitivity to abstraction and the resource availability status of this unit is "over licensed".

²⁶ Environment Agency, Water for Life and Livelihoods, Draft River Basin Management Plan North West River Basin District (Annex A, Current State of Waters), February 2009. The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009

²⁷ The Environment Agency split catchment into areas of surface water that can be managed as individual units.

Morecambe Bay SAC, SPA, Ramsar Effects in Combination with Other Plans and Projects

3.8 Aspects of the following plans and programmes could lead to 'in combination' effects on Morecambe Bay SAC, SPA and Ramsar, and Leighton Moss SPA and Ramsar, with regards to water resources and quality (see Appendix 2):

- Morecambe Bay Shoreline Management Plan: development, construction and maintenance of coastal defences;
- Lancashire Minerals and Waste Local Plan: Expansion/extension of existing sites/facilities, including increased handling at Heysham port;
- Cumbria Minerals and Waste Local Plan: Expansion/extension of existing sites/facilities;
- Cumbria Local Transport Plan: possible Morecambe Bay Barrage renewable energy project with road linking Heysham and Barrow;
- Lancaster District Core Strategy: Housing growth, increased infrastructure; management/transport and offshore wind power projects
- South Lakeland District Council Adopted Local Plan: Housing growth and offshore wind power projects
- Barrow-in-Furness Borough Council Local Plan: Housing growth, increased infrastructure, growth in requirement for waste management/transport, and Barrow Port AAP (which includes proposed housing, marina, cruise ship terminal and athletics and sports facilities)
- Wyre Borough Council Local Plan: Housing growth, increased infrastructure,;
- Gas Storage Facility, Gateway Storage Company Ltd: Approximately 25km south west of Heysham;
- Proposed new nuclear power station at Kirksanton;
- Decommissioning of Heysham 1 and 2 reactors (estimated for 2014²⁸ and 2023²⁹ respectively).

3.9 **Given that water abstraction requirements and discharge qualities (temperature, quantity and composition) for the nominated site are currently unknown, and the potential effects in-combination with the plans listed above, a precautionary approach requires that at the strategic level potential adverse effects be assumed for Morecambe Bay SAC, SPA and Ramsar as well as Leighton Moss SPA and Ramsar, in relation to water quality and abstraction, until greater site specific detail (including on technology and mitigation measures) is known. The potential for mitigation measures to effectively address the potential adverse effects on site integrity is**

28 <http://www.british-energy.com/pagetemplate.php?pid=92>

29 <http://www.british-energy.com/pagetemplate.php?pid=93>

considered further in the avoidance and mitigation section of this report.

Calf Hill and Cragg Woods SAC

- 3.10 Calf Hill and Cragg Woods SAC is vulnerable to lowering of the water table through water abstraction (see Appendix 1). The effects of this could include a transition of the designated ash/ alder woodland community to a drier (unfavourable) woodland type. Calf Hill and Cragg Woods SAC is in WRMU 3 (River Conder), which does not include the Heysham area. The Environment Agency³⁰ regards the Conder as being of “High” sensitivity to abstraction; however, current abstraction is minimal and resource availability status of this unit is “water available”.
- 3.11 **Given that Calf Hill and Cragg Woods SAC is 14 km to the west of the nominated site and in a separate WRMU whose resource availability is “water available”, water abstraction and discharge requirements for the nominated site are extremely unlikely to have an adverse effect on the integrity of the Calf Hill and Cragg Woods SAC.**

Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze

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

- Bowland Fells SPA
- Calf Hill and Cragg Woods SAC
- Liverpool Bay SPA
- Leighton Moss SPA, Ramsar
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Morecambe Bay SAC, SPA, Ramsar

Morecambe Bay SAC, SPA, Ramsar

- 3.12 The extent of the loss and/or fragmentation of marine, intertidal and terrestrial habitats from the construction of nuclear reactors,

30 Environment Agency, The Lune Catchment Abstraction Management Strategy, March 2004

construction areas and other infrastructure and facilities relating to the operation of the nuclear power station is currently unknown. This is because the project design and exact scope of the development and the requirements for coastal or sea defence infrastructure remain undetermined at this stage. Any loss of SAC designated habitats or SPA/Ramsar supporting habitats could be considered significant.

- 3.13 Physical loss of habitat through coastal squeeze is a recorded vulnerability of Morecambe Bay SAC. However, the SAC is recorded as being relatively robust to its current pressures and over 90% of each of its six component SSSIs are assessed by Natural England as being favourable condition.

Effects in Combination with Other Plans and Projects

- 3.14 Aspects of the following plans and programmes could lead to “in combination” effects on Morecambe Bay SAC, SPA and Ramsar, with regards to habitat loss and fragmentation (see Appendix 2)
- Morecambe Bay Shoreline Management Plan: development, construction and maintenance of coastal defences;
 - Lancashire Minerals and Waste Local Plan: expansion/extension of existing sites/facilities;
 - Cumbria Minerals and Waste Local Plan: expansion/extension of existing sites/facilities;
 - Cumbria Local Transport Plan: potential Morecambe Bay Barrage road crossing;
 - Lancaster District Core Strategy: Offshore wind power projects;
 - South Lakeland District Council Adopted Local Plan: Offshore wind power;
 - Barrow-in-Furness Borough Council Local Plan: Barrow Port AAP (which includes proposed housing, marina, cruise ship terminal and athletics and sports facilities);
 - Wyre Borough Council Local Plan: Housing growth, increased infrastructure;
 - Gas Storage Facility, Gateway Storage Company Ltd – Approximately 25km south west of Heysham.
- 3.15 **At this strategic stage, where detailed development plans that include the extent of additional land take for construction are unknown and the potential effects in combination with the plans and projects listed above, a precautionary approach (taking into account that the nominated site is adjacent to Morecambe Bay SAC, SPA and Ramsar) requires that adverse effects on integrity be assumed through habitat loss and coastal squeeze on Morecambe Bay SAC, SPA and Ramsar sites until greater site specific detail (including on technology and mitigation measures) is known. The potential for mitigation measures to effectively**

address the potential adverse effects on site integrity identified is considered further in the avoidance and mitigation section of this report.

Disturbance (Noise, Light, Visual)

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

- Bowland Fells SPA
- Calf Hill and Cragg Woods SAC
- Leighton Moss SPA, Ramsar
- Liverpool Bay SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Morecambe Bay SAC, SPA, Ramsar

Morecambe Bay SAC, SPA, Ramsar

3.16 Limited disturbance to birds (land and water-based) is a key environmental condition of Morecambe Bay SPA and Ramsar. Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. For example breeding Little Terns are highly sensitive to non-physical disturbance (i.e. noise, light, and visual) and are a qualifying interest feature of Morecambe Bay SPA. Noise and visual disturbance may cause nesting Little Terns to abandon eggs or chicks. Waders (which are among the interest features for the SPA and Ramsar designations for this site) can 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.³¹ The net effect of these disturbance events is a direct negative impact on species survival.

3.17 The nominated site is partly within and adjacent to the SPA and Ramsar designation. Without knowing the full extent and nature of the development proposals, it is not possible to determine how the nature or timing of the development may affect the all year round bird interest (including functionally connected feeding and roosting sites outside the designation boundaries) or to conclude that there will be no adverse effect.

³¹ Gill, Sutherland and Norris (1998) The consequences of human disturbance for estuarine birds. RSPB Conservation Review 12. 67-72.

Effects in Combination with Other Plans and Projects

- 3.18 Aspects of the following plans and programmes could lead to “in combination” effects on Morecambe Bay SPA and Ramsar, with regards to disturbance (see Appendix 2):
- Morecambe Bay Shoreline Management Plan: disturbance through development, construction and maintenance of coastal defences;
 - Lancashire Minerals and Waste Local Plan: expansion/extension of existing sites/facilities, including increased handling capacity at Heysham Port and increase of waste disposal at Fleetwood;
 - Cumbria Minerals and Waste Local Plan: expansion/extension of existing sites/facilities;
 - Cumbria Local Transport Plan: Morecambe Bay Barrage;
 - Lancaster District Core Strategy: Wind power projects, increase in tourism and increase in recreation pressure from housing; development;
 - South Lakeland District Council Adopted Local Plan: Wind power projects, increase in tourism and increase in recreation pressure from housing development;
 - Barrow-in-Furness Borough Council Local Plan: Barrow Port AAP (which includes proposed housing, marina, cruise ship terminal and athletics and sports facilities), increase in tourism and increase in recreation pressure from housing development;
 - Wyre Borough Council Local Plan: Housing growth (and associated recreation pressure), increased infrastructure, growth in requirement for waste management/transport and increased tourism;
 - Gas Storage Facility, Gateway Storage Company Ltd – Approximately 25km south west of Heysham;
 - Decommissioning of Heysham 1 and 2 reactors (estimated for 2014³² and 2023³³ respectively).
- 3.19 **Given that the disturbance levels (noise/ light/ visual) arising from the development are currently not defined and the potential effects in combination with the plans and projects listed above, a precautionary approach requires that potential adverse effects on site integrity be assumed for Morecambe Bay SPA and Ramsar sites until further information of the development (including details on technology and specific mitigation measures implemented) is available. The potential for mitigation measures to effectively address the potential adverse effects on site integrity identified is considered further in the avoidance and mitigation section of this report.**

32 <http://www.british-energy.com/pagetemplate.php?pid=92>

33 <http://www.british-energy.com/pagetemplate.php?pid=93>

Air Quality

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

- Bowland Fells SPA
- Calf Hill and Cragg Woods SAC
- Leighton Moss SPA, Ramsar
- Liverpool Bay SPA
- Morecambe Bay Pavements SAC
- Shell Flat cSAC and Lune Deep pSAC

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

- Morecambe Bay SAC, SPA, Ramsar

Morecambe Bay SAC, SPA, Ramsar

- 3.20 Changes in air quality can impact upon sensitive designated communities within the SAC and in turn, effect qualifying interest features of the SPA and Ramsar that depend upon them. It is suspected that nutrient deposition on many sand dunes throughout the UK is already above their critical threshold for impacts on vegetation³⁴³⁵. The consequence of this for dune slacks is the tendency to a speeded up succession away from dune slack vegetation³⁶³⁷.
- 3.21 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 the current generation at the nominated site indicates that all fall within authorised limits³⁸.

34 Jones, M.L.M. *et al.* 2002. Changing nutrient budget of sand dunes: consequences for the nature conservation interest and dune management CEH, Bangor

35 Jones, M.L.M. *et al.* 2004. Changes in vegetation and soil characteristics in coastal sand dunes along a gradient of atmospheric nitrogen deposition *Plant Biology* 6, 598-605

36 Jones, M.L.M. *et al.* 2002. Changing nutrient budget of sand dunes: consequences for the nature conservation interest and dune management CEH, Bangor

37 Jones, M.L.M. *et al.* 2004. Changes in vegetation and soil characteristics in coastal sand dunes along a gradient of atmospheric nitrogen deposition *Plant Biology* 6, 598-605

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

- 3.22 Site-specific air quality data provided by the UK Air pollution Information system³⁹ states that nitrogen deposition for dune systems and perennial vegetation of stony banks are at, or are in exceedance of critical loads for these habitat types within Morecambe Bay. Additional nitrogen deposition as a result of a new nuclear development could therefore be sufficient to result in significant changes to vegetation composition and habitat structure within Morecambe Bay with subsequent effects for the species that depend upon them, including the SPA and Ramsar qualifying interests.

Effects in Combination with Other Plans and Projects

- 3.23 Aspects of the following plans and programmes could lead to “in combination” effects on Morecambe Bay SAC, SPA and Ramsar, with regards to air quality (see Appendix 2):
- Morecambe Bay Shoreline Management Plan: Potential pollution through development, construction and maintenance of coastal defences;
 - Lancashire Minerals and Waste Local Plan: expansion/extension of existing sites/facilities, including increased handling capacity at Heysham Port and increase of waste disposal at Fleetwood;
 - Cumbria Minerals and Waste Local Plan: expansion/extension of existing sites/facilities with associated increase in transport;
 - Lancashire Local Transport Plan: Heysham to M6 Link could increase air pollution;
 - Cumbria Local Transport Plan: potential Morecambe Bay Barrage road link;
 - Lancaster District Core Strategy: Increased transport movements, proposed infrastructure, growth in requirement for waste management/transport;
 - South Lakeland District Council Adopted Local Plan: Increased transport movements, proposed infrastructure, growth in requirement for waste management/transport;
 - Barrow-in-Furness Borough Council Local Plan: Barrow Port AAP (which includes proposed housing, marina, cruise ship terminal and athletics and sports facilities), increased transport movements, proposed infrastructure, growth in requirement for waste management/transport;
 - Wyre Borough Council Local Plan: Increased transport movements, proposed infrastructure, growth in requirement for waste management/transport;
 - Gas Storage Facility, Gateway Storage Company Ltd: approximately 25km south west of Heysham.

39 <http://www.apis.ac.uk/>

- 3.24 **In the context of: known air quality conditions and interest feature vulnerabilities and the potential effects of a new nuclear development in combination with the plans and projects listed above, a precautionary approach requires that at this strategic level, potential adverse effects on site integrity be assumed for Morecambe Bay SAC, SPA and Ramsar until greater site specific detail (including on technology and mitigation measures) is known. The potential for mitigation measures to effectively address the potential adverse effects on site integrity identified is considered further in the avoidance and mitigation section of this report.**

Avoidance and Mitigation Measures

- 3.25 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 a development of the nominated site. These uncertainties limit the capacity of the HRA to reasonably predict the effects on a European Site⁴⁰.
- 3.26 At this strategic stage, the HRA for Heysham can make avoidance and mitigation recommendations in relation to Heysham to inform the SSA process, and therefore the overall development of the revised draft Nuclear NPS. These recommendations may also, subsequently provide guidance to the IPC and potential developers to ensure that the any future development at Heysham takes into account the findings of this strategic level assessment in more detailed, project level HRA
- 3.27 The HRA recommendations for avoidance and mitigation measures in relation to Heysham are discussed below, and summarised in Table 4. Part II of the [main] HRA report also summarises the measures identified in this report alongside those proposed by [other] individual site HRAs.
- 3.28 This HRA is part of an ongoing assessment process that will continue with detailed, project level HRA to be undertaken at the development consent stage, which will be informed by more precise information regarding the development plans for the nominated site at Heysham, including consideration of the impact on local defined habitats not covered by the HRA plan process, for example County Biological Heritage Sites and Local Nature Reserves on the site. The project level HRA, in line with the recommendations made in this strategic assessment may (as a result of project specific findings) consider alternative approaches to the development including changes to the

40 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.

nature, scale, technology applied or locational boundaries of the nominated site in order to avoid adverse effect on the integrity of the European Sites considered.

Water Resources and Quality

- 3.29 Avoiding adverse effects on 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 regulation). The majority of these effects will be mitigated at the site level through suitable design - including use of Sustainable Urban Drainage Systems (SuDS) - and the selection of appropriate construction methods and discharge standards.
- 3.30 However, the IPC, as guided by the Nuclear NPS, can also 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 the implementation of the nominated site proposals, and that decisions relating to best available technology take specific account of the sensitivities of the individual receiving environments.

Habitat (and Species) Loss and Fragmentation/Coastal Squeeze

- 3.31 Proposals for design and build should be required to avoid any direct habitat impacts that may lead to loss or fragmentation.
- 3.32 In relation to the identified issues at Heysham this may include for example, avoiding or minimising losses of habitat through site layout and design (for example using tunneling techniques for cooling water infrastructure to minimise impacts on habitats at the surface). It could also include sensitively designed sea defences (for example soft engineering for any upgraded coastal protection or use of permeable material for a marine landing facility). Connectivity of important wildlife corridors around the nominated site should be maintained and opportunities for habitat creation, restoration and enhancement should be sought where possible and incorporated into the overall mitigation package as good practice.

Disturbance (Noise, Light, Visual)

- 3.33 Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines and migration routes as well as feeding and roosting areas. These measures should be included within a construction environmental management plan, which would help to minimise disturbance. The precise detail and the nature of the measures required would need to be agreed with the Statutory Body

prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.

Air Quality

- 3.34 It is appropriate that the potential air quality impacts arising from developments are addressed as part of the development plan process. Requirements should include sustainable transport plans including, for example: the use of non-road transport where possible; the phasing of development; and robust monitoring at sites by operators (and the Environment Agency as appropriate) to track changes throughout the lifecycle of proposed operations. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between existing power stations and the new build overlaps. The assessment has noted that radioactive emissions are strictly controlled through regulation and the risk assessments undertaken for the consenting process.

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 efficiency of water use and 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 best available technology (BAT) take specific account of the sensitivities of the individual receiving environments Direct the selection of appropriate construction methods Radioactive emissions should be As Low As Reasonably Achievable (ALARA)⁴¹ with non-radioactive emissions required to be an improvement upon existing standards. Discharges (thermal or otherwise) which lead to adverse effects on the integrity of European Sites should not be permitted. |
| <ul style="list-style-type: none"> Water Quantity | <ul style="list-style-type: none"> Direct the selection of appropriate construction methods Direct requirements for the efficiency of water use Ensure that the volume of cooling water |

⁴¹ 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.

| Potential Effects | Suggested Avoidance and Mitigation Measures – Recommendations for the IPC |
|---|---|
| | discharged is within the capacity of the receiving environment |
| <ul style="list-style-type: none"> • Surface and Groundwater Flow | <ul style="list-style-type: none"> • Require suitable design, including use of Sustainable Drainage Systems (SuDS) • Require suitable design within abstraction mechanisms to ensure potential impacts upon groundwater flow are avoided • Direct the selection of appropriate construction methods |
| Habitat 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 or mitigate habitat losses within the Morecambe Bay SAC, SPA and Ramsar. • Use tunnelling techniques for cooling water infrastructure to minimise impacts on habitats at the surface • Maintain connectivity of wildlife corridors around the nominated site and seek opportunities for habitat creation, restoration and enhancement. • Require sensitive design for all coastal defence structures and marine landing facilities which are permeable to sediment flows along the coast • Require ecological mitigation and construction environmental management plans to be produced for the site |
| <ul style="list-style-type: none"> • Loss of Surrounding Habitat (construction of associated infrastructure) | <ul style="list-style-type: none"> • Require site/layout design to avoid or mitigate loss of functionally connected feeding and roosting sites outside the designated areas |
| <ul style="list-style-type: none"> • Barriers to Migration for fish and birds | <ul style="list-style-type: none"> • Protection measures should be incorporated into water intake systems so as to avoid depleting important food sources for birds such as fish/invertebrates • Require the screening of works areas, including the implementation of height restrictions where necessary to limit disturbance impacts upon any migratory paths |
| Disturbance (Noise, Light, Visual) | |
| <ul style="list-style-type: none"> • Construction and Decommissioning | <ul style="list-style-type: none"> • Require construction environmental management plans to minimise disturbance, |

| Potential Effects | Suggested Avoidance and Mitigation Measures – Recommendations for the IPC |
|--|--|
| | <p>for example through timing, visual/noise screening</p> <ul style="list-style-type: none"> • Require noise, light and visual impacts to be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines and migration routes as well as feeding and roosting areas (including functionally connected feeding and roosting sites outside the designated areas) • Require the incorporation of fish protection measures within cooling water intake/system design • Minimise need for encroachment of construction into sensitive areas through site design |
| Air Quality | |
| <ul style="list-style-type: none"> • Emissions arising from Construction, Operation and Decommissioning | <ul style="list-style-type: none"> • Require sustainable transport plans including, for example: the use of non-road transport where possible; the phasing of development; and robust monitoring by operators at sites to track changes throughout the lifecycle of proposed operations. • Promote the use of carbon-efficient forms of transport and construction during the power station lifecycle. • Support opportunities to offset emissions as appropriate. • Radioactive emissions should be ALARA with non-radioactive emissions required to be an improvement upon existing standards. • Ensure that monitoring by operators accounts for the potential for cumulative impacts where the phasing between existing power stations and the new build overlaps |

Summary of HRA Findings and Recommendations

3.35 The HRA Screening Assessment identified the likely significant effects on six European Sites as a result of impacts that may arise from the development of a new 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 ‘in-combination’;

in coming to a conclusion on the likelihood that the development of the nominated site for a new nuclear power station will have significant effects on European Site integrity.

- 3.36 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.
- 3.37 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 site integrity at five European Sites: Leighton Moss SPA and Ramsar, and Morecambe Bay SAC, SPA and Ramsar through impacts on water resources and quality, habitat and species loss and fragmentation/ coastal squeeze, disturbance (noise, light and visual), and air quality (see Table 5). This includes, in particular, effects arising from the development of areas of the Morecambe Bay SPA, SAC and Ramsar site within the nominated site and from essential off-site infrastructure.

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"> • Leighton Moss SPA • Leighton Moss Ramsar • Morecambe Bay SAC • Morecambe Bay SPA • Morecambe Bay Ramsar |
| Habitat (and species) loss and fragmentation/ coastal squeeze | <ul style="list-style-type: none"> • Morecambe Bay SAC • Morecambe Bay SPA • Morecambe Bay Ramsar |
| Disturbance (noise, light, visual) | <ul style="list-style-type: none"> • Morecambe Bay SPA • Morecambe Bay Ramsar |
| Air Quality | <ul style="list-style-type: none"> • Morecambe Bay SAC • Morecambe Bay SPA • Morecambe Bay Ramsar |

- 3.38 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.

- 3.39 **Further assessment supported by detailed data at project level is therefore required to determine whether nuclear power development at this nominated site could be undertaken without adversely affecting the integrity of European Sites at Heysham.**
- 3.40 **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 |
| AoS | Appraisal of Sustainability |
| APIS | UK Air Pollution Information System |
| DECC | Department of Energy and Climate Change |
| CAMS | Catchment Abstraction Management Strategy |
| CCW | Countryside Council for Wales |
| CHaMPs | Coastal Habitat Management Plans |
| cSAC | Candidate Special Area of Conservation |
| ES | Environmental Statement |
| EIA | Environmental Impact Assessment |
| 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 |
| NH ₃ | Ammonia |
| N2K | Natura 2000 sites |
| NO _x | Nitrogen Oxides |
| NPS | National Policy Statement |
| PPP | Plans, Programmes and Projects |
| pSAC | Possible Special Area of Conservation |
| pSPA | Potential Special Protection Area |
| pRamsar | Proposed Wetland Site designated by Ramsar Convention |
| Ramsar | Wetland Sites designated by the Ramsar Convention |
| RSPB | Royal Society for the Protection of Birds |
| SAC | Special Area of Conservation |
| SCI | Sites of Community Importance |
| SO ₂ | Sulphur Dioxide |

| | |
|------|-------------------------------------|
| SPA | Special Protection Area |
| SSA | Strategic Siting Assessment |
| SSSI | Site of Special Scientific Interest |
| SuDS | Sustainable Drainage Systems |
| WRMU | Water Resource Management Unit |

© Crown copyright 2010

URN 10D/892

Office for Nuclear Development
Department of Energy & Climate Change
3 Whitehall Place
London SW1A 2AW
www.decc.gov.uk