3. Approach to the PEIR

3.1 Scope of the PEIR

3.1.1 As identified within PINS Advice Note Seven (Reference 1. Planning Inspectorate), the provision of preliminary environmental information is intended to present emerging detail arising from the evolving environmental assessment process and is not expected to replicate or be a draft of the ES. As a result, the level of detail provided within a PEIR will be dependent on a number of matters, such as the completion status of the environmental baseline studies and, most importantly, the maturity of the project design.

Consultation undertaken to date

3.1.2 The preparation of this PEIR has been informed by a range of consultation with certain key statutory bodies and other stakeholders. The main purposes of the consultation, were to:

- inform and update about the status and evolving design of the Moorside Project;
- obtain existing baseline information that is relevant to defining the proposed scope of the assessment for the Moorside Project; and
- provide an opportunity to influence the preliminary assessment process within this PEIR, and subsequently the ES for the DCO.

3.1.3 Preliminary consultation took place in 2011 and 2012, at a very early stage in the process of defining the Moorside Project. This consultation was followed, in June 2014, by meetings with the Environment Agency (EA), the Marine Management Organisation (MMO), Natural England (NE), English Heritage (now Historic England), Copeland Borough Council (CBC), Allerdale Borough Council (ABC), Cumbria County Council (CCC) and Highways England. Following this, draft Survey and Monitoring Plans (SMPs) (Reference 3. NuGen) (http://www.nugeneration.com/download/Volume_3%20_Survey-and-Monitoring-Plans.pdf) were issued to these organisations for comment in order to obtain feedback on the scope and content of site specific surveys to inform the EIA and HRA processes.

3.1.4 NuGen has established a regular dialogue with the organisations cited under Para. 3.1.3 above, and in addition has also made contact with a wide range of other interested parties including (but not limited to):

- Carlisle City Council;
- Council for Nature Conservation and the Countryside (Northern Ireland);
- Cumbria Constabulary;
- Cumbria Health Trust;

- Cumbria Local Nature Partnership;
- Cumbria Tourism;
- Cumbria Wildlife Trust;
- Department of Environment, Communities and Local Government (Republic of Ireland);
- Department of Environment, Food and Agriculture (Isle of Man);
- Eden District Council;
- Environment Protection Agency (Republic of Ireland);
- Friends of the Lake District;
- Lake District National Park Authority (LDNPA);
- Major Infrastructure and Environment Unit;
- Maryport Fisheries;
- National Parks and Wildlife Service – Department of Arts, Heritage and Gaeltacht (Republic of Ireland);
- National Trust;
- NHS England;
- Northern Ireland Department of Environment;
- Northern Ireland Environment Agency;
- North Western Inshore Fisheries and Conservation Authority;
- Port of Workington;
- Public Health England;
- Royal Society for the Protection of Birds (RSPB);
- Scottish Environmental Protection Agency (SEPA);
- Scottish Natural Heritage;
- Sellafield Ltd.;
- West Cumbria Rivers Trust; and
- Whitehaven Fisheries.

3.1.5 Consultation took place in early 2015 on the draft EIA Scoping Report, which was followed by the SMPs and the final Scoping Report being submitted on 16 May 2015 to the Planning Inspectorate (PINS) on behalf of the Secretary of State for Energy and Climate Change (SoS). The EIA Scoping Report (Reference 2. NuGen) (http://www.nugeneration.com/have_your_say.html) and SMPs were submitted as part of documentation associated with the Stage One Consultation which was undertaken from May to July 2015. Formal comments provided in response to the Stage One Consultation have been taken

into consideration in the drafting of this PEIR. PINS issued a formal EIA Scoping Opinion (Reference 4. PINS) to NuGen in August 2015 which has taken into consideration a range of consultee/stakeholder responses. Each individual technical PEIR assessment has taken into consideration the feedback contained within the EIA Scoping Opinion wherever applicable and this is detailed within each chapter accordingly.

3.1.6 Throughout 2015 and into 2016, a range of technical meetings have been held with those statutory bodies and other stakeholders identified above on a quarterly basis. Quarterly reports have been prepared by NuGen and released prior to these meetings to assist in the discussions that took place. These quarterly meetings have ensured continuing engagement with those statutory bodies and stakeholders. The meetings have provided a forum to update consultees on the emerging results from the range of baseline surveys which will inform the EIA for the Moorside Project and to receive and respond to feedback and analysis of survey data collected. In addition to the quarterly meetings, a variety of ad-hoc technical consultation meetings have been held which have focused on specific elements of importance to individual environmental topics. Further topic related information about the consultation process to date is summarised in **Chapters 4 to 21** of this PEIR.

3.1.7 Consultation has also been carried out with respect to the Habitats Regulations Evidence Plan which will be used to support a Habitats Regulations Assessment for the Moorside Project. The development of this plan has involved consultation meetings with a core group of consultees (ABC, CBC, CCC, EA, MMO and NE). Much of the information in this Evidence Plan is also relevant to the EIA process, although the primary purpose of the Plan is to inform the assessment of the potential effects of the Moorside Project on European wildlife sites, as required under The Conservation of Habitats and Species Regulations 2010 (Reference 5. UK Government) and the Offshore Marine Conservation (Natural Habitats, &c) Regulations 2007 (Reference 6. UK Government).

Methodology

3.1.8 The assessment process set out below is consistent with the methodologies identified in the Scoping Report and Scoping Opinion (Reference 4. PINS) for each technical topic. In some topic chapters, at the time of the PEIR it may not have been possible to complete all steps in the methodologies due to the evolving nature of the design information available and the availability of baseline information. Where it has not been possible to follow the methodology in full, this is clearly explained in the relevant topic chapter and the limitations of the assessment are set out.

3.1.9 A summary of the overall assessment methodology is provided here in **Chapter 3**. Each technical topic chapter provides details and justification where necessary (due to, for example professional sector guidance) of how their methodology differs from the overarching approach outlined below.

Aspects of the environment

3.1.10 Schedule 4(1) paragraph 19 of the EIA Regulations, identifies that a PEIR, and an ES, should include "A description of the aspects of the environment likely to be significantly affected by the development, including, in particular, population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors." The aspects of the environment that need to be included, and the level of information required to be provided on each aspect in a PEIR, is defined in the EIA Regulations as what is "reasonably required" for the assessment of the environmental effects of the proposed development and any associated development (see the definitions of 'Environmental Statement' and 'preliminary environmental assessment' in regulation 2(1) of the EIA Regulations). The following table shows where the different aspects of the environment have been considered in the PEIR:

Table 3.1 Aspects of the Environment

Aspect	Location in the PEIR
Population	Chapter 4: Transport Chapter 5: Noise and vibration Chapter 6: Air quality Chapter 8: Visual Chapter 9: Countryside Access Chapter 10: Socio-economics Chapter 20: Radiological
Fauna	Chapter 17: Marine ecology Chapter 18: Terrestrial and freshwater ecology Chapter 19: Ornithology
Flora	Chapter 17: Marine ecology Chapter 18: Terrestrial and freshwater ecology
Soil	Chapter 11: Soils, geology and land quality
Water	Chapter 13: Freshwater Environment: Groundwater Chapter 14: Freshwater Environment: Surface Water Chapter 16: Marine water and sediment quality
Air	Chapter 6: Air Quality Chapter 20: Radiological
Climatic factors	Chapter 13: Freshwater Environment: Groundwater Chapter 14: Freshwater Environment: Surface Water Chapter 17: Marine ecology Chapter 18: Terrestrial and freshwater ecology Chapter 19: Ornithology Chapter 21: Climate
Material assets including architectural and archaeological heritage	Chapter 12: Historic Environment

Aspect	Location in the PEIR
Landscape	Chapter 7: Landscape
Marine and coast:	Chapter 15: Marine and coastal physical processes Chapter 16: Marine water and sediment quality
Radiological	Chapter 20: Radiological
Inter-relationships	Chapter 22: Interrelationships

3.2 Identification of baseline conditions

3.2.1 The Moorside Project will have multiple stages - construction (including site preparation and site demobilisation), operation (including maintenance) and finally a decommissioning stage. The baseline characterisation will consider both the current baseline, and the future evolving baseline through the various project phases.

3.2.2 In relation to the Transport and Air Quality chapters, work is on-going in relation to modelling of the future baseline conditions. **Chapter 4**, Transport and **Chapter 6,** Air Quality therefore focus on the current baseline for the PEIR, and will be updated with the modelling results for the final ES.

3.3 Overview of assessment methodology

3.3.1 The approach taken to the preparation of this PEIR has been informed by Advice Note Seven (Reference 1. Planning Inspectorate). Whilst this document will ultimately inform the EIA and ES for the DCO application, and therefore focusses on the likely significant environmental effects of the Moorside Project, the PEIR also contains information related to effects which may not be significant in order to aid on-going consultation and to ensure the scope of the assessment remains appropriate.

3.3.2 Decisions about which effects have the potential to be of likely significance and which effects should be scoped out (because they are not likely to be significant) have been made within this PEIR and will continue to be evaluated with reference to:

- Receptors that could be affected by activities required for the implementation of the Moorside Project during the construction and operational phases (and, where appropriate, decommissioning of infrastructure and facilities).
- Changes to environmental baseline conditions that could result from the Moorside Project and other activities.
- The magnitude of the predicted environmental changes that the receptors would potentially be exposed to.

- The extent to which the design of the Moorside Project mitigates (i.e. avoids or reduces) the project's anticipated potentially significant effects.

Evolution of the scope of the EIA, identification of mitigation and residual effects

3.3.3 The design proposals for the Moorside Project will continue to evolve through an iterative process in response to, for example, scheme design changes, new environmental information and consultation (the latter including consultation under sections 42, 47 and 48 of the Planning Act 2008). Throughout this iterative process, opportunities will be explored to adopt good environmental practice and other management and control measures to prevent, reduce and where possible offset any significant adverse effects that cannot be mitigated through project design iteration. Opportunities will also be taken to deliver environmental enhancements related to the Moorside Project through good design and dialogue with statutory bodies and stakeholders.

3.3.4 Where the design iterations are incorporated by NuGen into its development proposals, these will be discussed with the statutory bodies and stakeholders so that they can consider how the scope of the assessment may need to updated.

Significance Evaluation Methodology

Receptor sensitivity or value

3.3.5 The sensitivity or value of a receptor is largely a product of the importance of an asset, as informed by legislation and policy and by professional judgement. Receptors may, for example for landscape or ecology, be legally defined as being of international or national importance, or may be designated at a county or district level and these definitions can be used as a starting point for identifying the sensitivity or value. The use of a receptor would also play a part in its classification. For example, when considering effects on the amenity of the population, a receptor used for living or recreational purposes may be valued more than a workplace as the environmental quality is more likely to be an important part of that receptor's use. Each chapter in the PEIR explains how the receptor sensitivity has been defined for that topic area.

Magnitude of change

3.3.6 The magnitude of change to a receptor from the environmental effects of the proposals would be identified on a scale from very low to very high (encompassing minor alterations or change, up to major changes or the total or substantial loss of the receptor). For certain topics, the magnitude of change may be able to tie into guidance on levels of acceptability (e.g. for air quality or noise) but for others it will be a matter of professional judgement to determine the magnitude. Each chapter in the PEIR explains how the magnitude of change has been defined for that topic area.

Determination of significance

3.3.7 The determination of significance is derived with reference to the information about the nature of the development, the receptors and their sensitivity and the magnitudes of change identified. A matrix based on that shown in **Table 3.2** is used to guide the determination by combining the sensitivity and magnitude of change for each receptor and professional judgement is used to refine or confirm the conclusions. The use of professional judgement is important, as for certain subjects the lines between the sensitivities or magnitudes of change may not be clearly defined and the resulting assessment conclusions may need clarifying. Any specific variations applicable to specific topics will be fully detailed in the relevant technical chapter.

Table 3.2 Significance evaluation matrix

		Magnitude of change				
		Very high	**High**	**Medium**	**Low**	**Very low**
Sensitivity	**Very high**	**Major** (Significant)	**Major** (Significant)	**Major** (Significant)	**Major** (Significant)	**Moderate** (Potentially Significant)
	High	**Major** (Significant)	**Major** (Significant)	**Major** (Significant)	**Moderate** (Potentially Significant)	**Minor** (Not Significant)
	Medium	**Major** (Significant)	**Major** (Significant)	**Moderate** (Potentially Significant)	**Minor** (Not Significant)	**Negligible** (Not Significant)
	Low	**Major** (Significant)	**Moderate** (Potentially Significant)	**Minor** (Not Significant)	**Negligible** (Not Significant)	**Negligible** (Not Significant)
	Very low	**Moderate** (Potentially Significant)	**Minor** (Not Significant)	**Negligible** (Not Significant)	**Negligible** (Not Significant)	**Negligible** (Not Significant)

Note: Significant effects are those identified as 'Major'. 'Moderate' effects have the potential to be significant, but this depends on the environmental topic and the use of professional judgment.

3.4 Cumulative effects

Introduction

3.4.1 Cumulative effects will be assessed in accordance with the EIA Regulations which stipulate that an ES will have to include:

"A description of the likely significant effects of the development on the environment, which should cover the direct effects and any…cumulative…effects of the development, resulting from: (a) the existence of the development; (b) the use of natural resources; (c) the emission of

pollutants, the creation of nuisances and the elimination of waste, and the description by the applicant of the forecasting methods used to assess the effects on the environment." (Paragraph 20, Part 1, Schedule 4)

3.4.2 The need to consider cumulative effects in planning and decision making is also set out in planning policy, in particular NPS EN 1 at paragraph 4.2.5 which states that "*When considering cumulative effects, the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development (including projects for which consent has been sought or granted, as well as those already in existence)*" NPS EN-1 goes on to say at paragraph 4.2.6 that the Secretary of State should consider how the "*accumulation of, and interrelationship between, effects might affect the environment, economy or community as a whole even though they may be acceptable when considered on an individual basis with mitigation measures in place*."

3.4.3 PINS Advice Note Seventeen (Reference 7, Planning Inspectorate) is a new advice note on cumulative effects assessment. The advice note recommends that "*other development*" with potential to give rise to cumulative effects should be identified by the applicant with reference to the proposed nationally significant infrastructure project's Zone of Influence (ZoI).

3.4.4 Paragraph 3.1.3 of Advice Note Seventeen states that having established and documented the ZoI for each topic in the ES, the applicant should obtain available information on "*other development*". Table 3 in the advice note identifies the types of "*other development*" that should be included in a cumulative effects assessment, and these are shown in **Table 3.3**.

Table 3.3 Other development to be included in cumulative assessment

Hierarchy of development	'Certainty' of development	
Tier 1	Under construction	Decreasing level of detail likely to be available 
	Permitted application(s), but not yet implemented;	
	Submitted application(s) not yet determined	
Tier 2	Projects on the Planning Inspectorate's Programme of Projects where a scoping report has been submitted	
Tier 3	Identified in the relevant Development Plan (and emerging Development Plans - with appropriate weight being given as they move closer to adoption) recognising that much information on any relevant proposals will be limited	

3.4.5 Once a *"long list"* of "*other development*" has been identified, then the applicant should identify a *"short list"* of "*other development*" for the purposes of the cumulative effects assessment (Section 3.2 of Advice Note Seventeen). Advice Note Seventeen recommends that consideration of the

temporal scope of "*other development*", the scale and nature of "*other development*" and any other relevant factors would be an appropriate basis on which to assess whether or not "*other development*" should be on the short list.

3.4.6 At the present time, the long list is still being confirmed, although an emerging short list of developments has been identified which have the potential to interact with the Moorside Project and result in cumulative effects. This list does not currently include the proposed Nuclear New Build (NNB) power station at Wylfa, in Anglesey, although it will form part of a future cumulative effects assessment as part of the radiological chapter of the forthcoming ES.

3.4.7 Further details relating to these *"other developments"* are given in the sub-sections below, with reference to whether they are Tier 1, 2, or 3 projects, or other potential projects and their approximate locations relative to the Moorside Project Sites are shown on **Figures 3.1- 3.3**. This information has been acquired from publically available sources, e.g. developer or local authority websites and, for the purposes of the Stage 2 Consultation, this is mainly based on the information available at 31 March 2016. However, the exception is information relating to the West Cumbria Mining Project, where reference is made to the exhibition boards that have been produced for the company's public consultation event of 8-10 April 2016.

Table 3.4 Emerging short list of developments likely to be relevant for cumulative assessment

Development	Location	Developer	Anticipated start date
Tier 1 projects			
Sellafield Site decommissioning	Decommissioning of buildings and infrastructure	Nuclear Decommissioning Authority	Ongoing
Upgrade of BAe Systems' Barrow Site	Barrow	BAe Systems	2016
Low Level Waste Repository	Drigg	Nuclear Decommissioning Authority	2016
Biopharmaceutical manufacturing facility extensions	Ulverston	GSK	2016
Walney Extension Offshore Wind Farm	Offshore near Heysham	Dong Energy	Onshore – Ongoing Offshore - 2016
Tier 2 projects			
North West Coast Connections (new power lines)	West Cumbria	National Grid	2019

Development	Location	Developer	Anticipated start date
Tier 3 projects			
West Cumbria Mining Project (coal mine)	Whitehaven (mine head)	West Cumbria Mining	2017
West Cumbria Water Supply Pipeline	West Cumbria	United Utilities	2017
Other potential projects			
Heysham new nuclear power station	Heysham, Lancashire	EDF Energy	Unknown
West Cumbria Tidal Lagoon	West Cumbria coast	Tidal Lagoon Power	Unknown
Offshore Wind Farms*	Heysham	Unknown	Unknown

There will be windfarms, other than Walney Extension, which are located within the Irish Sea and within the 200 km ZoI proposed in respect of seabirds to cover statutory designated sites, with mobile seabird interest in the wider Irish Sea, and those sites potentially located further afield, where there qualifying interest species had potential max mean foraging ranges that overlapped with the marine study area. See **Table 3.8** below.

3.4.8 It should be noted that *"existing development"* (i.e. development that has been constructed and is operational) will form part of the current baseline against which the Moorside Project will be assessed.

3.4.9 As far as it possible at this stage, based on the information available with respect to "*other development*" to be included in the cumulative assessment, NuGen will assess cumulative effects in each topic chapter, both in terms of the effects of the Moorside Project as a whole and then the relevant component parts of the Moorside Project cumulatively with the identified *"other development"*. As the Moorside Project's defined Zone of Influence will differ depending on which topic chapter is under consideration, the identified *"other development"* may vary from chapter to chapter, but each chapter will make it clear why any specific *"other development"* has not been included in the cumulative effects assessment.

3.4.10 For the purposes of clarity, from hereon, the assessment of the Moorside Project as a whole will be referred as *"accumulated effects"* and the assessment of the component parts of the Moorside Project with *"other developments"* will be referred to *"cumulative effects"*.

Tier 1 projects

Sellafield Site Decommissioning

3.4.11 The information set out below was sourced from the Sellafield Plan[1] (Issue 1, August 2011). This document presents the only publically accessibly document containing information regarding the decommissioning and decontamination programme underway at the Sellafield Site. The Sellafield Plan is essentially a strategy document setting out high-level information regarding the ongoing

[1] http://www.sellafieldsites.com/press/sellafield-plan/ (last accessed March 2016).

decontamination and decommissioning of the Sellafield Site. Given the phased manner in which the works are being undertaken, there is no planning or environmental information available in respect of future decommissioning and decontamination.

3.4.12 Sellafield Site decommissioning involves the decontamination and demolition of plant and buildings on the Sellafield Site which are no longer fit for purpose. Decommissioning at Sellafield started in the 1980s and is an ongoing, long-term process. The decommissioning programme issued in August 2011 includes the physical decommissioning of:

- **Solid Waste Storage Cells**. This involves the characterisation and segregation of waste into intermediate level waste and low level waste. Low level waste will be consigned to the Low Level Waste Repository and intermediate level waste will be returned to the cell until the Box Encapsulation Plant is available. When the cells are empty, the facility will be decommissioned and demolished. This activity is ongoing throughout the 2010/11 to 2025/26 reporting period.
- **Pile Chimney**. The remaining pile chimney of the Windscale Piles will be decommissioned and demolished down to approximately 35 m level. The remaining structure will then be placed under care and maintenance along with the Pile 2 remaining structure. Following final decommissioning of the pile reactors under the Windscale Programme, the remaining pile chimney structures will be demolished. Dismantling will continue through the reporting period 2010/11 to 2025/26 with decontamination activities scheduled to begin during the 2019/20 financial year.
- **Separation Purification Plant**. This is currently in the interim decommissioning phase with the focus on removing the ventilation system, followed by decommissioning and demolition of the building.
- **Fuel Fabrication Facilities**. Table Facilities will be monitored once operations have finished, followed by a programme of decommissioning and demolition of the building.
- **North Group Compound**. Once the compound is no longer operational it will continue to be monitored before interim decommissioning and demolition is completed. The resultant land will be the first to be transferred to the Land and Groundwater Remediation Programme.
- **Analytical Services Labs**. The interim decommissioning of specific laboratories is continuous. The long term decommissioning and demolition sites will form part of the Infrastructure Programme.
- **Separation Product Finishing and Storage Facility**. Specific zones within the facility will be decommissioned and demolished. The remaining decommissioning and demolition work is captured as part of the Safe Storage of Plutonium Programme.
- **Low Active Effluent Treatment Tank**. Following the recovery of effluent from the identified tanks, a programme of decontamination and demolition can be completed. The final decommissioning is captured as part of the

Effluence Management Programme. Decontamination and demolition works are due to commence in 2021/22.

- **Highly Active Liquor Tank**. Removing the intermediate level waste inventory is under way, then the module will be decontaminated. The remaining decommissioning of the tank is captured as part of the Highly Active Liquor Programme.

3.4.13 The overall programme identifies varying timescales for the commencement / completion of the decommissioning of the above key activities. However it is largely an ongoing process throughout the 2011/12 to 2025/26 reporting period. The programme currently excludes the specific decommissioning of facilities which are currently operational or subject to retrieval operations. It should also be noted that although Sellafield is in a decommissioning phase this may entail the building of new facilities to enable the decommissioning of old.

Upgrade of BAE Systems' Barrow Site

Overview

3.4.14 The 170-acre Barrow Site has hosted design and build activities in relation to submarine provision for the Royal Navy for more than a century. The site is subject to a major facilities investment programme over the next 10 years, known as the Site Redevelopment Programme (SRP). The SRP comprises a £300-plus million investment into the Barrow Shipyard in preparation for the construction of a new class of nuclear submarines, replacing the current Astute Class submarines (some of which are still to be constructed). The investment will enable the build, test and commissioning of new submarines for what is known as the Successor Programme. The Successor Programme submarines will be significantly larger in size than the Astute Class submarines, and are anticipated to enter into service in 2028.

3.4.15 The construction of the new facilities as part of the SRP and the construction of the remaining Astute Class submarines will need to take place concurrently. The physical SRP works commenced in 2015 and are planned to be completed by 2021. There are 32 separate projects, under which there are five key/major new build facilities:

- Central Yard Complex;
- Paint Facility;
- Support Integration Facility;
- Primary Build Capability;
- Extensions to new assembly shop;
- Nuclear Submarine Berth; and
- Crew Accommodation Building.

3.4.16 The Outline Construction Programme for the SRP indicates that the majority of construction activities would take place between 2016 and 2018. The projects associated with the expansion programme, which have been brought forward so far to enable these development activities, are briefly summarised in the sub-sections below.

Central Yard Complex

3.4.17 A planning application for the Central Yard Complex (CYC) was approved by Barrow-in-Furness Borough Council in October 2015 (Ref. B02/2015/0363). The proposal comprises:

- Large assembly hall, also including a workshop, stores, offices and amenities, measuring 178 m(l) x 94 m(w) x 45 m(h);
- Hardstanding area and vehicle and pedestrian routes; and
- Temporary construction related works including a gatehouse, site entrance, parking, office and welfare facilities and a material laydown and storage area.

3.4.18 No specific timescales are set out for the completion of the CYC. However, in line with the outline construction programme, construction is anticipated to take place between 2016 and 2018.

Paint Facility

3.4.19 A planning application for a new surface preparation and painting building was approved by Barrow-in-Furness Borough Council in October 2015 (ref. B08/2015/0417). The application proposed a new building within the Central Yard Area (CYA) in order to provide for shot blasting, painting and tiling operations in a controlled environment. The facility is expected to be completed by May 2017.

3.4.20 The scheme comprises:

- New building, including cell enclosures, blast area, transfer areas, workshops, plant, storage, amenities, and waste removal and measuring 105 m (l) x 65 m (w) x 27 m (h) and 6 x exhaust flues with a height of 29 m.
- Temporary construction related works including a gatehouse, site entrance, parking, office and welfare facilities and a material laydown and storage area.

Support Integration Facility (SIF)

3.4.21 A planning application for the SIF was approved by Barrow-in-Furness Borough Council in November 2015 (ref. B08/2015/0418), which will provide specialist workshop and testing facilities as part of the SRP. The development comprises:

- A new 2-storey building, comprising: workshop, testing areas, offices and welfare measuring 39 m (l) x 25.5 m (w) x 8.0 m (h).
- A 70-space surface car park.

3.4.22 No specific timescales are set out for the completion of the SIF however, in line with the outline construction programme, construction is anticipated to take place between 2016 and 2018.

Primary Build Capability (PBC)

3.4.23 A planning application for the PBC, which is central to the SRP, was approved by Barrow-in-Furness Borough council in November 2015 (ref. B06/2015/0179). The application comprises an extension to the Devonshire Dock Hall (DDH) to provide a controlled environment for ship and submarine assembly.

3.4.24 The approved development primarily consists of a linked group of building comprising material stores, workshops and assembly items including:

- Installation hall (D58), which is 40 m (l) x 30 m (w) x 32 m (h).
- Fabrication and initial assembly building (D59), which is 90 (l) x 80 m (w) x 24 m (h).

3.4.25 The PBC is expected to be completed by the second quarter of 2018.

Extensions to the New Assembly Shop (NAS)

3.4.26 A planning application for the NAS was approved by Barrow-in-Furness Borough Council in October 2015 (ref. B08/2015/0422). The application comprises extensions to the NAS together with associated site infrastructure and related works.

3.4.27 No specific timescales are set out for the completion of the SIF however, in line with the outline construction programme, construction is anticipated to take place between 2016 and 2018.

Environmental Topics and Study Area

3.4.28 The application submissions brought forward to date have included either an Environmental Statement or Environmental Report in order to provide an appropriate level of assessment of the potential environmental impacts that could arise as a result of each development and to describe measures that have been identified, to avoid or mitigate these throughout the development of the project, where appropriate.

3.4.29 **Table 3.5** sets out the environmental topics which were considered in relation to each of the projects discussed above and the study areas employed.

Table 3.5 BAE Systems Site Remediation Programme: Environmental Topics and Study Areas

Environmental Topic	Study Area
Land Quality	Focussed on ground and groundwater conditions within the SRP area.
Drainage and Flood Risk	Flood Risk Assessment undertaken on the SRP site area.

Environmental Topic	Study Area
Traffic and Transport	Transport Assessment undertaken on the SRP, which considers the potential for effects to occur on the Strategic Road Network.
Noise and Vibration	Noise and vibration assessment undertaken on the SRP. The study area comprised the area immediately adjacent to BAE Systems' site, up to a distance of around 1150 m.
Air Quality	Air quality assessment undertaken on the SRP which considered air quality in proximity to the proposed SRP and an assessment of potential changes in pollutant concentrations at nearby sensitive receptors. The closest sensitive receptors were largely residential within 200 m of the SRP area.
Ecology	A 2 km search area was used for locally, nationally and internationally designed sites of nature conservation importance. A 250 m search radius for water bodies and notable habitats such as hedgerows and woodland. A 1 km search area for non-statutory wildlife sites i.e. Sites of Importance for Nature Conservation and protected / notable species.
Cultural Heritage	The recorded historic environment resource within a 500 m study area around the site.
Landscape Character and Visual Setting	Landscape character within south-west Cumbria and visual setting from viewpoints within surrounding area Market Street, Barrow; North Street, Barrow; Dawsons Steps, Walney Island; Mikasa Street and Empress Drive junction, Walney Island; Ramsden Dock Road, Barrow; and Strand and Salthouse Road junction, Barrow.

3.4.30 Due to the nature of the proposed development within an active naval shipyard and taking into account the industrial and built up character of the surrounding environment, study areas for the environmental topics covered a relatively small geographic area around the BAE Systems' site, with the exception of traffic and transport which considered the potential for effects to occur on the Strategic Road Network as a result of the SRP as a whole.

Low Level Waste Repository, Drigg

Overview

3.4.31 Originally established in 1959, on the site of a former World War 2 munitions factory, the Low Level Waste Repository (LLWR) is the UK's national repository for the disposal of LLW. LLW Repository Ltd. has managed the site since July 2007. As the UK's principal disposal facility for LLW, the site is the only facility that is permitted to receive all categories of LLW from across the UK. The great majority of waste is brought to the site by rail and it is anticipated that this will continue to be the case over the long term. However, access by road will also need to be maintained, particularly for items that are too large to be transported on the rail network.

3.4.32 The LLWR site covers an area of around 110 ha. The LLWR includes the main disposal area, railway sidings and waste reception area, a grouting facility, office accommodation and ancillary facilities which are connected by a network of internal service roads.

3.4.33 In late October 2015, LLWR submitted a major planning application that, if granted, would secure the site's future in the long term. The proposals described in the application comprise a series of works that collectively provide for the construction of new vaults to provide additional disposal capacity and for the eventual final capping of the site and its future closure. In summary, the proposals seek to enable the phased construction of an extension to Vault 9 – 9a and two new vaults (10 and 11) where low level waste would be disposed of in specially grouted containers. The application would also allow the higher stacking of containers in Vault 8 and the disposal of containers in Vault 9, where they can currently only be stored. In addition, it would allow the construction of a final cap over both the existing and the new vaults, and over seven landfill-style trenches where waste was historically disposed of (prior to the opening of the site's first vault in 1988). The final cap would ensure the site would be able to be progressively restored to grassland with screening planting on the site perimeter.

3.4.34 The application is due to be heard in 2016, and if successful, related work could start in 2017. The construction has been broken down into a series of phases as follows:

- Phase 1 Site preparation (2016–2020);
- Phase 2 Cap Vault 8 and Construct Vaults 9A and 10 (2019–2023);
- Phase 3 Cap Vault 9 and Construct Vault 11 (2023–2030);
- Phase 4 Cap Vault 10 (2030–2032); and
- Phase 5 Cap Vault 11 and Close Site (2045–2051).

Environmental Topics and Study Areas

3.4.35 The planning application submitted by LLW Repository Ltd was supported by an Environmental Statement which sets out an assessment of the potential environmental impacts that could arise as a result of the development and describes measures that have been identified, to avoid or mitigate these throughout the development of the project, where appropriate.

3.4.36 **Table 3.6** sets out the environmental topics which were considered and the study areas employed.

Table 3.6 Low Level Waste Repository, Drigg – Environmental Topics and Study Areas

Environmental Topic	Study Area
Radiological and Non-Radiological Effects	The Drigg Coast SSSI/SAC; groundwater pathway and gas pathway.

Environmental Topic	Study Area
Transport	Transport Assessment undertaken, which considers the potential for effects to occur on the local highway network within the vicinity of the site and rail capacity of the Cumbrian Coast Line.
Noise and Vibration	Noise assessment undertaken taking into account the nearest noise sensitive receptors, the furthest of which lies 280 m from the application boundary. Vibration impacts were scoped out of the assessment as such impacts are not an issue usually associated with this type of development.
Landscape and Visual	Defined by a combination of professional judgement and the Zone of Theoretical Visibility of the final capping landform, modelled on the theoretical visibility of the final restoration landform. Furthest viewpoint within the study area is Viewpoint 10: Muncaster Fell at the Top of Hooker Crag at a distance of 5850 m east of the site boundary. Furthest viewpoint outwith the study area is Viewpoint 12: Top of Irton Pike at a distance of 6900 m north east of the site boundary.
Ecology and Nature Conservation	Study areas focused largely within the LLWR site boundary or within 500 m of it, with the exception of the desk study for which the survey extent of 15 km for Natura 2000 sites and 2 km for statutory and non-statutory designated sites and protected, notable or scarce species.
Air Quality	An air quality assessment undertaken, which considered air quality in proximity to the site and an assessment of potential changes in pollutant concentrations at nearby sensitive receptors. Sensitive receptors fall within a range of 0 m (Drigg Coast SSSI and SAC) from the site to up to 280 m (Sandy Acre and Meadowbridge residential receptors).
Geology, Soils and Hydrogeology	Immediate site and adjacent Drigg SAC and SSSI.
Climate Change and Coastal Erosion	The site lies within Shoreline Management Plan Sub Cell 11d: the varied coastline between Hodbarrow Point, Haverigg, at the mouth of the Duddon estuary, and St. Bees Head incorporates the Ravenglass estuary complex as well as the Rivers Calder and Ehen. The immediate focus of the assessment appears to be on Drigg Beach and dune system as a result of the presence, development or the operation of the LLWR.
Surface Water	Study area for water quality impacts comprises the surface water bodies that are hydrologically connected with the proposed scheme site. These include Drigg Stream, East-East Stream, The River Irt, the Ravenglass Estuary, the Cumbria Coastal Area and a number of small ponds on site.
Economic and Social Effects	The assessment considers contribution to the local community (undefined) but assumed to be the Borough of Copeland and strategic contribution to Cumbria as part of the wider nuclear sector within West Cumbria.

Biopharmaceutical Manufacturing Facility Extensions, Ulverston

3.4.37 In December 2014 GlaxoSmithKline (GSK) was granted outline planning permission by South Lakeland District Council (Ref. Sl/2014/0615) for a new biopharmaceutical manufacturing facility in Ulverston. The application sought outline permission for:

3.4.38 "Pharmaceutical manufacturing facility (B2) of up to 119,000 sqm comprising up to 3 production buildings, ancillary office and research and development (B1a/B1b), ancillary staff canteen (A3), an ancillary distribution and storage warehouse (B8), a utilities building, a sports and social centre comprising 3 pitches and a bowling green, a sports centre (D2) of up to 6,250 sqm, up to 2 associated sports facilities buildings (D2), a substation, a waste water treatment plant, associated soft and hard landscaping, parking areas, highway works and all other associated infrastructure".

3.4.39 The site lies approximately 1.2 miles (1.9 km) east of Ulverston town centre. To the east of the GSK site lies Morecambe Bay, designated as a Natura 2000 site for the biodiversity that it supports. Morecambe Bay is designated as a Special Protection Area (SPA), RAMSAR site, Special Area of Conservation (SAC) and Site of Special Scientific Interest (SSSI).

3.4.40 The GSK site, which is just under 47 ha in size, is currently split into four separate elements, the existing GSK manufacturing facility, known as the Cephalosporin ('Cephs') site; the West site which is predominantly cleared after previous manufacturing use, the South site which currently includes the sports and social facilities and playing fields; and the Southern Peninsula which houses two waste water treatment plants on its northern edge.

3.4.41 Part of the West Site, the whole South Site and part of the Southern Peninsula site are contained within the boundary of the planning application. The existing manufacturing plant and part of the West Site form the area for the new Cephs car park, which was approved in April 2014 (Ref. SL/2014/0112).

3.4.42 From information available from South Lakeland District Council, work has commenced on the discharge of conditions in relation to the Cephs Car Park but no reserved matters applications have been submitted in respect of the new biopharmaceutical facility.

3.4.43 Indicative timescales set out within supporting documentation for the outline application, suggest that construction works in respect of the new biopharmaceutical facility would be phased as follows:

3.4.44 Phase 1 relates to the construction of the new biopharmaceutical facility and would start immediately following approval of reserved matters (which was anticipated in mid-2015 but has yet to be submitted) and is predicted to last between 30 and 36 months. It is anticipated to include site clearance, earthworks, drainage works, construction of a consolidated biopharmaceutical production facility, construction of a general yard area, creation of car parking for 140 vehicles, rationalisation of an existing waste water treatment works, and construction of a fire retention pond.

3.4.45 Phase 2 relates to the creation of a replacement sports and social facility. The timing of Phase 2 is currently unknown. However it is assumed that it would come forward within a period of 8 years from the date outline permission was granted (December 2014).

3.4.46 Phase 3 is assumed to come forward within a period of 15 years from the date outline planning permission was granted. It would comprise of the construction of a standalone biopharmaceutical facility, extension of existing buildings with support offices, construction of additional car parking for circa227 vehicles and the construction of additional wastewater treatment facility capacity.

3.4.47 Taking into account the indicative timescale assumed within the project documentation, and assuming approval of reserved matters is gained in 2016, construction of the new facility would be completed in 2031.

Environmental Topics and Study Areas

3.4.48 Due to the scale of the new biopharmaceutical manufacturing facility, an Environmental Statement was submitted as part of the planning application. **Table 3.7** sets out the environmental topics which were considered and the study areas employed.

Table 3.7 New Biopharmaceutical Manufacturing Facility, Ulverston – Environmental Topics and Study Areas

Environmental Topic	Study Area
Ecology	Study area for gathering information during the desk study is defined as the Application Site's footprint plus a 2 km zone from the site boundary. For the majority of field surveys, the Site's footprint plus a 50 m zone around the Site boundary is the defined study area (within the exception of a 500 m zone for the purposes of the great crested newt survey).
Landscape and Visual	2 km zone from the project boundary.
Transport	Transport Assessment undertaken for the study area which comprises of those roads and junctions that may experience a material increase in traffic as a result of the development. This incorporated the area directly surrounding the site, along with several junctions along the A590 strategic road network.
Hydrology, Hydrogeology and Soil (including Land Quality)	Proposed development area with a surrounding 1 km buffer considered sufficient to encompass all significant pathways associated with groundwater and surface water catchments which may be subject to impact from the proposals.
Flood Risk and Drainage	Assessment focuses on the flood risk to all areas within the boundary of the West Site and South Site. To undertake the assessment the wider area was reviewed to enable assessment of existing flood defences, potential flood routes and existing drainage systems/linkages. The key boundaries to the Study Area in this respect are the Ulverston Canal (north), Morecambe Bay (east), Dragley Back (south west) and North Lonsdale Road (west).

Environmental Topic	Study Area
Air Quality	Construction Phase – the area within 350 m of the boundary of the site and 50 m of the routes used by construction vehicles on the public highway, up to 500 m from the site entrance. Road Traffic Emissions – the spatial extent of the road network on which development-generated traffic is predicted to travel and identified receptor locations situated along the road network assessed (all located within Ulverston).
Noise and Vibration	Key receptors considered were: sensitive ecological receptors immediately surrounding the proposed facility; and sensitive residential receptors close to the proposed facility.
Cultural Heritage	A 1 km study area centred on the proposed site was established to assess the existing historic environment baseline data. The study area also incorporated South Ulverston, Canal Foot and Rame Hill to provide a context for the assessment of the known and potential historic environment resource.
Socio-Economics	Spatial scope covers the local level, comprising the ward in which the site is located (Ulverston East), the town of Ulverston (based on Ulverston East, Central, North, Town, South and West wards), the district level of South Lakeland, Cumbria (County) and the North West (Region).
Microclimate (lighting)	A 2 km zone from the application site and selected high sensitivity receptors outside the 2 km zone (Ford Park, 2.1 km; Sir John Barrow's Monument, Hoad Hill, 2.2 km; Park Head (Holker Park Estate adjacent caravan site), 2.47 km; Bigland Hall Equestrian Centre – Grassgarth public bridle path, 6.8 km).
Recreation and Access	The development footprint, plus Public Rights of Way within an approximate 2 km radius to capture direct and indirect potential impacts.
Waste	Waste arising during construction and operation.

Walney Extension Offshore Wind Farm

3.4.49 The Walney Extension Offshore Wind Farm is being progressed by Dong Energy. The scheme comprises the construction of an onshore substation, cabling from this substation to the national grid and construction of a further 105 offshore wind turbines bringing the total number to 207.

3.4.50 The scheme will be located 19 km off the Cumbrian coast, adjacent to the existing Walney Offshore Wind Farm.

3.4.51 The extension proposal was granted consent in November 2014 and onshore construction commenced in December 2015. Offshore construction is anticipated to commence in April 2016 and to be completed in December 2019.

Tier 2 projects

North West Coast Connections (NWCC), West Cumbria

3.4.52 The information set out below was sourced from the North West Coast Connections project website[2]. The website contains a number of documents regarding consultation undertaken and route corridor studies. A preferred route option is emerging through appraisal of various route options. However, at this stage, there are no planning or environmental documents regarding the preferred route option in the public domain.

3.4.53 The North West Coast Connections, which is a NSIP, aims to connect new energy generating projects, which are being built, or are planned to be built, in Cumbria and Lancashire, to the existing grid network. These projects will include the Moorside Project, as well as other energy generating projects in the North- West region.

3.4.54 The NWCC seeks to build 4,400kv transmission circuits, or two double circuits, to connect the Moorside Power Station to the National Grid.

3.4.55 Indicative timescales are as follows:

- 2009–2017: Ongoing works to design the scheme, appropriate public consultation, baseline and assessment studies and associated reporting with an aim to:
  - 2017: Submit an application for Development Consent to the Secretary of State for Energy and Climate Change.
  - 2018: Decision on the DCO application made by the Secretary of State for Energy and Climate Change.
  - 2019: Begin construction phase of the project.
  - 2024: Complete connection is made in time for first round of generation at Moorside.

Tier 3 projects

West Cumbria Mining Project, Whitehaven

3.4.56 The information set out below was sourced from the West Cumbria Mining project website[3], together with the presentation materials for the Public Information Exhibitions held from 8-10 April 2016. The website and exhibition boards contain information on the project's progress to date, including consultation undertaken, indicative timescales and where the mine will potentially be located. At the time of preparation of this PEIR, descriptive details regarding this project are emerging on an ongoing basis, although no

[2] http://www.northwestcoastconnections.com/ (last accessed March 2016)

[3] http://www.westcumbriamining.com/ (last accessed March 2016)

planning or environmental documentation is currently available for use with a cumulative effects assessment.

3.4.57 The Whitehaven Coking Coal Project proposed by West Cumbria Mining (WCM) would provide a new coal mine development to work an offshore area of the Cumbrian Coalfield to a depth of approximately 550 m below the coastline.

3.4.58 Although two mine access options were being considered to access the target coal zone, information contained on the exhibition boards has confirmed that the northern option, involving the use of the existing Sandwith Anhydrite mine drifts, with new extension drift tunnels to access the target coal zone, now represents the preferred option. As such, only this option has been considered in the context of the preliminary cumulative effects assessment carried out for this PEIR.

3.4.59 WCM's preferred option is to construct the minehead and processing facilities at the former Marchon Chemical Works to the north of Sandwith. This option would re-use the former Anhydrite mine drifts, which would be extended southwestwards into the coal horizons. Since the minehead site is not located on the railway line, it is also proposed to construct a buried conveyor system (thought to be at shallow depth and constructed by cut and cover) over a distance of approximately 2 km in a broadly southeasterly direction between the proposed minehead at Marchon and the site of a former drift mine, which is located to the south and east of NuGen's proposed Mirehouse Site. This conveyor would then transport processed coal to a train coal load facility which would also be built parallel to the existing railway located adjacent to the boundary of the Mirehouse Site.

3.4.60 The timescales for the implementation of this proposed project are:

- Phase 1: Involved the drilling of boreholes onshore to provide more details about the quantity and quality of coking coal. These investigatory works commenced in October 2014 and were completed in the first quarter of 2015. It also involved some initial community engagement and project feasibility work.
- Phase 2: Up to eight offshore boreholes drilled in the sea off the West Cumbria coast. These are designed to further define the extent of coal seams and financial viability of the proposed operation. These investigatory works were started in Q2 and Q3 of 2015 and are programmed to continue (into Phase 3) during spring and summer quarters of 2016. Phase 2 also included the initial planning related inputs, including the scoping exercise.
- Phase 3: This covers all ongoing work during 2016; culminating in the submission of a planning application in Q4 2016.

3.4.61 WCM has assumed a period of nine months would be sufficient for the determination of the planning application with mine construction works anticipated to be undertaken between Q4 2017 and Q4 2018. Coal production is then scheduled to commence at the start of 2019.

3.4.62 In terms of the potential for cumulative effects to occur with the Moorside Project, it is considered that WCM's preferred option has the potential to

interact with the Mirehouse Site. The main reason for this is that part of the preferred option's infrastructure, i.e. its proposed railhead facility, would potentially be located immediately adjacent to the Mirehouse Site and within the ZoIs for most of the environmental topics that need to be assessed.

3.4.63 Accordingly, and subject to the confirmation of the WCM development proposals, there would be potential for significant effects to occur, especially in the context of the landscape and visual assessments and the assessments of noise & vibration and air quality. Whether such effects would occur during the construction period of the WCM site, will depend on the relative timescales of each, although based on the current WCM construction timescale of completion by the end of Q4 2018, this seems unlikely as the Mirehouse construction works is expected to commence in 2019. However, potentially significant cumulative effects would be likely to occur across a range of environmental topics once the mine is operational and dispatching coal from its proposed railhead, since this would coincide with the construction and then phased occupation of the Mirehouse Site, together with its planned use as a railway station for part of the Moorside Site construction workforce.

West Cumbria Water Supply Pipeline, West Cumbria

3.4.64 This project is being progressed by United Utilities to enable the cessation of existing water supply abstraction from Ennerdale Water by 2025 by which date the Environment Agency intends to withdraw the current abstraction licence. United Utilities plan to link West Cumbria to the rest of the regional water network via a major new pipeline running from Thirlmere to West Cumbria, and also to develop a new water treatment works, pumping stations and underground service reservoirs.

3.4.65 Principal project components include:

- A preferred route for a new large water pipe that broadly follows the direction of A591 highway northwards from Thirlmere, skirting Keswick and passing to the east of Bassenthwaite, before turning due west towards Bridekirk.
- New water treatment works at Pingy Woods, Bridekirk, north of Cockermouth;
- New smaller water pipes distributing water from the new water treatment works; and
- Service reservoirs proposed at Moota Hill and High Leys and existing reservoirs at Summergrove, Kelton Fell, Cornhow, Stainburn and Quarry Hill.

3.4.66 As a large-scale planning proposal, each section of the proposed pipeline is intended to be considered and determined by each Local Planning Authority through the normal planning application process. The bulk of the proposed development will lie within the Lake District National Park Authority (approximately 50%), with the rest of the development affecting land within Allerdale Borough Council (approximately 40%) and Copeland Borough Council

(approximately 10%)[4]. It is understood that a planning application was submitted was submitted in January 2016 to the three Authorities and is currently being validated. It is expected that planning permission would be achieved from each Authority in June 2016.

3.4.67 Construction is predicted to commence in March 2017 with construction expected to be completed by October 2021 and the project in operation in 2022. At the current time, there are no planning or environmental documents associated with the project in the public domain. Given the scale of the project it is highly likely that an Environmental Statement will accompany the planning applications when submitted.

Other potential projects

Heysham New Nuclear Power Station, Lancashire

3.4.68 Heysham Nuclear Power Station is owned and operated by EDF Energy. The site is divided into two separately managed stations, Heysham 1 and Heysham 2. On 18 October 2010 the Government announced that Heysham was one of the eight sites it considered suitable for future nuclear power stations. However in 2012, it was reported that EDF Energy cancelled an agreement with the National Grid to set up any new connection to the grid from Heysham, with all its plans for new build nuclear power stations being principally focused on Hinkley Point in Somerset and Sizewell in Suffolk. Therefore, there do not appear to be any plans to bring forward a new nuclear power station at Heysham within the foreseeable future.

West Cumbria Tidal Lagoon

3.4.69 This tidal power generation scheme is being promoted by Tidal Lagoon Power and is proposed to be developed between the Port of Workington and Dubmill Point, near Allonby. The plans are anticipated to include a sea wall to capture tides that could generate over two Gigawatts of power from up to 90 turbines set within the sea wall. The project was expected to be operational by 2023 and would be a larger version of the company's Swansea Bay lagoon, although the Swansea project is reported to have been delayed by a year as negotiations continue over the level of Government funding for the project. As a result, the West Cumbria scheme may also be delayed, whilst Tidal Lagoon Power concentrate on the construction of its Swansea Bay project[5]. No planning or environmental information is therefore available regarding the project.

[4] Information sourced from the 'Planning Performance Agreement for United Utilities West Cumbria Pipeline Project' dated 26 March 2016 available at http://councilportal.cumbria.gov.uk/ieListDocuments.aspx?CId=117&MId=7586&Ver=4 (last accessed March 2106)

[5] http://www.timesandstar.co.uk/news/business/Workington-tidal-lagoon-plan-on-back-burner--825dac06-ba30-418e-a9e4-d6932a2ebc45-ds (last access April 2016)

Assessment Methodology

Stage One

3.4.70 In line with the staged approach set out in PINS Advice Note Seventeen, the first stage of this preliminary Cumulative Effects Assessment (CEA) has involved the identification of the ZoI for each environmental topic area being considered. For this PEIR, the ZoIs for the relevant environmental topic areas for each of the Moorside Project Sites have been summarised in **Table 3.8** and the information mapped using GIS software. Individual ZoI maps around each Moorside Project Site have then been produced and are presented and discussed in each technical chapter, as appropriate.

3.4.71 In terms of the spatial scope of the ornithological assessment of cumulative effects, the cumulative ZoI differs from the ZoI that has been used to determine the ornithological receptors assessed in respect of each Moorside Project Site. This is primarily due to the mobile nature of these species, some of which travel large distances for foraging and migration. For some receptors (primarily designated sites) it is therefore considered more appropriate to use a ZoI centred around the key breeding areas/colonies, since these encompass their qualifying species core foraging ranges. For terrestrial birds, a cumulative ZoI from each relevant Moorside Project Site of 10 km has been used to allow assessment of cumulative effects on the potentially connected local area population.

3.4.72 A number of subjects: Transport (**Chapter 4**); Countryside Access (**Chapter 7**) and Socio-Economics (**Chapter 10**), have not had a ZoI mapped in the same way as other chapters. For example, with respect to Transport this is because the ZoI represents the supply routes by road, rail and marine, which would be used to supply the Moorside Project Sites. Because of this, the assessment of the effects on Transport receptors would automatically cover the whole project and there would be no need for a separate assessment of this type. However, there is insufficient information available at this stage to determine whether such effects would be significant or not. Further details of the approach that would adopted with respect to these chapters are given in **Table 3.8**.

3.4.73 There is also the potential that the ZoIs may be subject to revision as assessment work advances and the likelihood for, and geographical extent of, potential significant environmental effects becomes clearer. In such circumstances the summary table and mapping would be amended accordingly and the details reflected in the ES.

Table 3.8 Moorside Project Sites - Summary of Zones of Influence (ZoIs) by environmental topic

Environmental Topic	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site
Chapter 4: Transport	The Transport ZoI is effectively the primary and secondary routes between the M6 at Junction 40 and 44 and the Moorside Project Sites in West Cumbria. The key highways are therefore the A66 and A595, together with other roads located in the Workington and Whitehaven areas. Sections of the A66 and A595 will serve all of the Moorside Project Sites and therefore the assessment of effects on road transportation receptors will automatically represent a whole project assessment and a separate exercise will not need to be carried out. Similarly, the same principle applies to both rail and marine transportation. Further details are provided in Chapter 4.					
Chapter 5: Noise & Vibration	A **2 km** ZOI around the defined site boundary is considered appropriate in order to include the locations of the likely affected noise sensitive receptors.	From scoping report: A ZOI of **500 m** around the boundary is considered appropriate in order to include the locations of the likely affected noise sensitive receptors for each AD site.			A ZOI of **600 m** (as defined by DMRB methodology) either side of the proposed railway edge (may be extended to include sensitive receptors that are likely to experience noise and vibration effects from the existing or new transport infrastructure).	
Chapter 6: Air Quality	Emissions to atmosphere from activities on the site during site prep & clearance, construction & operation is up to **5 km** from the site boundary; For ecological receptors, European sites out to **10 km** and local sites out to **2 km;** Road traffic air quality effects, DMRB guidance states **200 m** from the road centreline for both human and ecological receptors.	Up to **500 m** from the site boundary for emissions to atmosphere; For road traffic air quality effects, **200 m** would be applied where flow increase thresholds are infringed.			Up to **500 m** from the site boundary for emissions to atmosphere.	

Environmental Topic	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site
Chapter 7 & 8 Landscape & Visual	Defined study area has a radius of **22 km** from the centre of the defined site, includes all potential landscape receptors that are located within 20 km of the site boundary. A second smaller study within the ZOI has been designed to concentrate assessment upon receptors most likely to sustain significant landscape effects. This has a radius of **12 km** from the centre of the defined site and includes all potential landscape receptors that are located within **10 km** of the site boundary.	Areas within **5 km** of the site boundary. This has been defined based upon the types of development proposed for each site and the limited potential for significant landscape effects to occur beyond this distance.				
Chapter 9: Countryside Recreation	Countryside Recreation ZoIs are not specifically geographically related, but will vary to some extent on the nature and status/importance of the PRoWs or cycle routes and whether they form part of a local, regional or national network. At this stage, whilst it has not been possible to finalise Countryside Recreation ZoIs, it is noted (for example) that Sustrans Route 72 connects between most of the Moorside Project Sites and, as such, it will therefore be subject to whole project effects.					
Chapter 10: Socio-Economics	**Labour Market:** A 90 minute travel time zone which equates to the County of Cumbria and a more immediate area of Copeland and Allerdale (equating to approximately 45 minute travel time zone). **Economy:** Whilst the supply chain for the development and induced expenditure effects would probably extend across the UK, the baseline is focused on the County of Cumbria, which provides consistency with the area for effects on the labour market. **Population:** Focus is upon Cumbria and a more immediate area defined as Copeland (and to some extent, parts of Allerdale). Population effects will arise in Egremont and Whitehaven, possibly Workington and Barrow where the majority of workers who move into the area for employment are likely to be accommodated. **Housing, social and community infrastructure, and other community issues:** as for population.					

Environmental Topic	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site
Chapter 11: Soils, Geology & Land Quality	Up to **1 km** from the defined site boundary, which is considered to be the maximum distance over which most forms of potential contamination are realistically likely to migrate from the source location; some receptors may be assessed on the basis of a 250 m buffer depending on receptor type and activity.					
Chapter 12: Historic Environment (including offshore and intertidal archaeology)	Up to **10 km** from the boundary for designated heritage assets; up to **1 km** from the boundary for non-designated heritage assets and features of interest.	Up to **2 km** from the boundary for designated heritage assets; up to **1 km** from the boundary for non-designated heritage assets and features of interest.				
Chapter 13: Freshwater Environment - Groundwater	While groundwater effects may be propagated up gradient, given the regional groundwater flow direction towards the coast and the typical characteristics of a sandstone aquifer, a **3 km radius study area** around the Moorside Site has been used. This would be extended to include the entirety of any WFD water bodies that intersect the 3 km study area.	**3 km** radius study area, plus WFD water bodies.			**1 km** radius study area, plus WFD water bodies.	
Chapter 14: Freshwater Environment - Surface Water	A **3 km radius study area** around the defined site boundary is considered to be sufficient, because the location of the main site in close proximity to the coast limits the scope for the propagation of downstream effects in the freshwater environment, and there is no pathway for propagation of direct surface water effects upstream (although there is possibility of indirect ecological effects arising further upstream as a consequence of surface water effects).	A **3 km** radius study area around the defined site boundary.				

Environmental Topic	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site
Chapter 15: Marine and Coastal Physical Processes	An area extending approximately **12 km** to the north and south of the site (from St Bees Head in the north to the Ravenglass estuary complex in the south) and **10 km** out to sea.	N/A				
Chapter 16: Marine Water and Sediment Quality		N/A				
Chapter 17: Marine Ecology						
Chapter 18: Terrestrial & Freshwater Ecology	Statutory designated biodiversity sites within 15 km; non-statutory designated biodiversity sites within 3 km; local BAP priority species/habitats within 3 km; records of legally protected or otherwise notable species (excluding birds) within 3 km (1 km for aquatic vertebrates and 10 km for bats); freshwater aquatic environments within 3 km.					
Chapter 19: Ornithology	The Marine ZoI extends to 200 km for seabirds, to cover statutory designated sites with mobile seabird interest in the wider Irish Sea and those sites further afield where there qualifying interest species had potential max mean foraging ranges that overlapped with the marine study area. Marine study area extends to **10 km** offshore and **25 km** along the coast from St. Bees Head in the north to Ravenglass Estuary in the south. Intertidal ZOI (associated with the Moorside Search Area and a 500 m buffer) extends from Calder Viaduct in the south to Braystones Waste Water Treatment Plan in the north.	A **250 m** buffer around the redline boundary for all terrestrial sites.				

Environmental Topic	Moorside Site	Corkickle Site	Mirehouse Site	Egremont Site	Corkickle to Mirehouse Railway Site	St. Bees Railway Site
	A **250 m** buffer is around the redline boundary for all terrestrial sites.					

3.4.74 As outlined in **Table 3.4** above, Stage One in the identification of "*other development*" to be included in the cumulative assessment requires a long list of *"other developments"* to be identified from discussions with Local Planning Authorities, the examination of planning applications on Local Planning Authority websites and of allocations in planning policy documents. The initial exercise undertaken for this PEIR has identified a number of *"other developments"*, which were also noted in the Scoping Report issued in April 2015.

3.4.75 Using the mapping, it has been possible to determine which of the *"other developments"* identified in **Table 3.4** are likely to fall within the ZoIs for each environmental topic and, therefore, where the potential for cumulative impacts may exist. This information is presented in **Table 3.9**. However, it should be noted that the current limited level of information regarding the environmental topic ZoIs for these *"other developments"* means that this assessment is preliminary and subject to change once more information becomes available.

3.4.76 The *"other developments"* considered in **Table 3.9** have been ordered on the basis of their Tier level, together with the degree (i.e. the number of environmental topics) to which cumulative effects are likely to occur with the each of the Moorside Project Sites.

Table 3.9 Preliminary consideration of other developments that have the potential to act cumulatively with the Moorside Project Sites

Environmental Topic	Stage One							Stage Two		
	Within Moorside ZoI	Within Corkickle ZoI	Within Mirehouse ZoI	Within Egremont ZoI	Within Corkickle to Mirehouse Railway ZoI	Within St. Bees Railway ZoI	Progress to Stage 2	Overlap in Temporal Scope	Scale and nature of development likely to have a significant effect?	Progress to Stage Three
1. Sellafield Ltd/Nuclear Decommissioning Authority – Sellafield Site Decommissioning. Decontamination and demolition of plant and buildings on the Sellafield Site (Tier 1)										
Decontamination and demolition programme which is largely an ongoing process throughout the 2011/12 to 2025/26 reporting period. Borders Moorside Site to southeast.										
All topics	Yes	No	No	No	No	No	Yes	Yes for construction and operational phases.	Yes, although no assessment information is available from Sellafield Ltd/NDA. The decommissioning programme overlaps with the Moorside Project construction programme.	Yes
LVIA		No	No	Yes	No	No				
T&FW Ecology		Yes	Yes	Yes	Yes	Yes				
Ornithology	Yes	Yes	Yes	Yes	Yes	Yes				
2. National Grid - North West Coast Connections (NWCC), West Cumbria – Four 400kv transmission circuits or two double circuits to connect Moorside Power Station and other potential energy developments to the national grid system (Tier 2).										
A number of route corridor studies have been undertaken and a preferred route has been identified. Indicative timescales anticipate a planning submission in 2017 with consent gained by 2019 and completion of the connection by 2024.										
All topics	Yes						Yes	Yes, for construction phase only.	Yes, although no assessment information is available from National Grid at this time. The construction operations for both projects will overlap.	Yes
Noise & Vibration		No	Yes	Yes	Yes	No				
Air Quality		No	Yes	Yes	Yes	No				
LVIA		Yes	Yes	Yes	Yes	Yes				

Environmental Topic	Stage One							Stage Two		
	Within Moorside ZoI	Within Corkickle ZoI	Within Mirehouse ZoI	Within Egremont ZoI	Within Corkickle to Mirehouse Railway ZoI	Within St. Bees Railway ZoI	Progress to Stage 2	Overlap in Temporal Scope	Scale and nature of development likely to have a significant effect?	Progress to Stage Three
Soils, Geology & Land Quality			Yes	Yes	Yes					
Historic Env		No	Yes	Yes	Yes	Yes				
FW Groundwater		Yes	Yes	Yes	Yes	Yes				
FW Surface Water		Yes	Yes	Yes	Yes	Yes				
Marine Ecology		No	No	No	No	No				
T&FW Ecology		Yes	Yes	Yes	Yes	Yes				
Ornithology	Yes	Yes	Yes	Yes	Yes	Yes				
3. West Cumbria Mining, Whitehaven Coking Coal Project, Whitehaven. Construction of a new underground coal mine to produce coking coal.										
Development of a drift mine from one of two options sites and the construction of a new railhead facility in the Pow Beck Valley Area. The current timescales anticipate a planning application submission in Q1 2017 and mine construction undertaken between Q4 2017 and Q4 2018, with coal production commencing in Q4 2018.										
Noise & Vibration	No	No	Yes	No	Yes	No	Yes	Yes during construction and operational phases.	Yes, although only limited information is currently available from West Cumbria Mining. It is envisaged that the operational period of the mine and railhead would overlap with the construction and operational phases of the Moorside Project.	Yes
Air Quality	Yes	No	Yes	No	Yes	No				
LVIA	Yes	Yes	Yes	Yes	Yes	Yes				
Soils, Geology & Land Quality	No	No	Yes	No	Yes	No				
Historic Env	Yes	No	Yes	No	Yes	Yes				
FW Groundwater	No	Yes	Yes	No	Yes	Yes				

Environmental Topic	Stage One							Stage Two		
	Within Moorside ZoI	Within Corkickle ZoI	Within Mirehouse ZoI	Within Egremont ZoI	Within Corkickle to Mirehouse Railway ZoI	Within St. Bees Railway ZoI	Progress to Stage 2	Overlap in Temporal Scope	Scale and nature of development likely to have a significant effect?	Progress to Stage Three
FW Surface Water	No	Yes	Yes	No	Yes	Yes				
Marine Ecology	Yes	No	No	No	No	No				
T&FW Ecology	Yes	Yes	Yes	Yes	Yes	Yes				
Ornithology	Yes	Yes	Yes	Yes	Yes	Yes				
4. LLW Repository Ltd, Drigg. The construction of new vaults to provide additional disposal capacity. (Tier 2)										
A planning application was submitted to Cumbria County Council in October 2015 and determination is anticipated in early 2016. If successful, works would commence in 2016 with site preparation being completed in 2020. Vault construction would take place between 2019 and 2030. Vaults would be capped with the site closed by 2051. The site covers 110 ha and the proposal comprises a main disposal area, rail sidings, waste reception area, grouting facility, network of internal service roads and office accommodation.										
Air Quality	Yes	No	No	No	No	No	Yes	Yes, for construction phase only.	Yes, the construction phases would overlap with the construction programme for the Moorside Project, and specifically in respect of several environmental topics at the Moorside Site itself Terrestrial and freshwater ecology cumulative effects could occur with respect to the Egremont Site and the St. Bees Railway Site.	Yes
LVIA	Yes	No	No	No	No	No				
Historic Env	Yes	No	No	No	No	No				
Marine Coastal Physical Processes	Yes	No	No	No	No	No				
Marine Ecology	Yes	No	No	No	No	No				
T&FW Ecology	Yes	No	No	Yes	No	Yes				
Ornithology	Yes	Yes	Yes	Yes	Yes	Yes				

Environmental Topic	Stage One							Stage Two		
	Within Moorside ZoI	Within Corkickle ZoI	Within Mirehouse ZoI	Within Egremont ZoI	Within Corkickle to Mirehouse Railway ZoI	Within St. Bees Railway ZoI	Progress to Stage 2	Overlap in Temporal Scope	Scale and nature of development likely to have a significant effect?	Progress to Stage Three
5. United Utilities - West Cumbria Water Supply Pipeline. New large water pipe, new water treatment works, smaller water distribution pipes, service reservoir. (Tier3)										
Indicative timescales anticipate a planning application submission in January 2016 with the expectation of achieving planning permission in March 2017. Construction is expected to commence in March 2017, with the project operational in 2022.										
Air Quality	Yes	No	No	No	No	No	Yes	Yes, for construction phase only.	At the current time, there are no planning or environmental documents associated with the project in the public domain. However, there is potential for the project to have cumulative effects in some way with each component part of the Moorside Project.	Yes
LVIA	Yes	Yes	Yes	Yes	Yes	Yes				
Soils, Geology & Land Quality	No	No	Yes	No	No	No				
Historic Env	Yes	No	Yes	No	No	No				
FW Groundwater	No	Yes	Yes	No	Yes	No				
FW Surface Water	No	Yes	Yes	No	Yes	No				
T&FW Ecology	Yes	Yes	Yes	Yes	Yes	Yes				
Ornithology	Yes	Yes	Yes	Yes	Yes	Yes				

Environmental Topic	Stage One							Stage Two		
	Within Moorside ZoI	Within Corkickle ZoI	Within Mirehouse ZoI	Within Egremont ZoI	Within Corkickle to Mirehouse Railway ZoI	Within St. Bees Railway ZoI	Progress to Stage 2	Overlap in Temporal Scope	Scale and nature of development likely to have a significant effect?	Progress to Stage Three
6. Dong Energy - Walney Extension Wind Farm. Extension to existing offshore windfarm located between 9 km and 15 km from Walney Island (i.e. 19 km off the Cumbrian Coast) near Barrow. (Tier 1)										
The scheme comprises the construction of an onshore substation, cabling from this substation to the national grid and construction of a further 105 offshore wind turbines bringing the total number to 207. Offshore construction is anticipated to commence in April 2016 and to be completed in December 2019.										
LVIA	Yes	No	No	No	No	No	Yes	Yes, for construction and operational phases.	Unlikely given its distance from Moorside and limited temporal overlap.	Yes
Ornithology	Yes	No	No	No	No	No			Yes, in the context of seabirds (see **Table 3.8**) because the ZoI extends to 200 km.	
7. BAE Systems, Barrow. Upgrading of BAE Systems Barrow Site. (Tier 2)										
£300 million initiative to upgrade and improve the Barrow ship yard to make ready for new submarine building. The site is located approximately 41 km to the southeast of Moorside. The site redevelopment programme commenced in 2015 and is planned to be completed by 2021, with the majority of construction activities taking place between 2016 and 2018.										
Other than with the possible exception of Transport and Socio-economics, about which we do not have enough information to develop topic ZoIs, none of the environmental topic ZoIs for the Moorside Project are considered likely to interact with the Barrow development.							No	N/a	N/a	No

Environmental Topic	Stage One							Stage Two		
	Within Moorside ZoI	Within Corkickle ZoI	Within Mirehouse ZoI	Within Egremont ZoI	Within Corkickle to Mirehouse Railway ZoI	Within St. Bees Railway ZoI	Progress to Stage 2	Overlap in Temporal Scope	Scale and nature of development likely to have a significant effect?	Progress to Stage Three
8. GSK, Ulverston. Creation of a new biopharmaceutical manufacturing facility and a sports facility building. (Tier 1)										
Outline planning consent has been granted in 2014 for the new biopharmaceutical manufacturing facility, although no reserved matters information has been submitted yet. Indicative timescales set out within application documentation suggest construction would commence in 2016 and the new facility would be completed by 2031.										
Other than with the possible exception of Transport and Socio-economics, about which we do not have enough information to develop topic ZoIs, none of the environmental topic ZoIs for the Moorside Project are considered likely to interact with the Ulverston development.							No	N/a	N/a	No
9. EDF Energy - Heysham New Nuclear Power Station, Heysham. Located approximately 57 km to the southeast of the Moorside Site.										
There does not appear to be any immediate plans to bring forward the new nuclear power station as it is reported that EDF Energy has cancelled an agreement with the National Grid to set up any new connection to the grid from Heysham.										
Given the current situation, it is not possible to undertake a cumulative assessment at this time.							No	N/a	N/a	No
10. Tidal Lagoon Power, Tidal Lagoon West Cumbria near Workington. Located approximately 30-34 km to the north of the Moorside Site, between the Port of Workington and Dubmill Point, near Allonby, although closer to other Moorside Project Sites.										
The plans are anticipated to include a sea wall to capture tides that could generate over two Gigawatts of power from up to 90 turbines set within the sea wall. However, the project is currently on hold as the focus of the developer is on its Swansea Bay project.										
Given the current situation, it is not possible to undertake a cumulative assessment at this time.							No	N/a	N/a	No

3.4.77 A total of 10 *"other developments"* have been given preliminary consideration as to whether they have the potential to interact cumulatively with the Moorside Project. Of these, it has been concluded that, based on the information currently available, six are most likely to need to be subject to a level of detailed assessment, i.e. at Stage 2 and then 3, with respect to at least one environmental topic.

3.4.78 Unsurprisingly the key *"other developments"* are those located in relatively close proximity to the Moorside Site itself, where the temporal scope will overlap with the construction phase of Moorside, e.g. the Sellafield Decommissioning (Tier 1) and North West Coast Connections (Tier 2) projects. However, the West Cumbria Mining (Tier 3) project, also has considerable potential to interact with the Moorside Project, especially with respect to the Mirehouse Site.

Stage Two

3.4.79 In order to determine that the CEA is proportionate, Stage Two involves an information gathering exercise in order to compile as much detailed information as possible on the *"other developments"* which are confirmed as potentially giving rise to cumulative effects. The information gathered is required in order to determine:

- The temporal scope of the development;
- The scale and nature of the development; and
- Any other relevant factors.

3.4.80 Therefore, for each of the *"other developments"* listed in **Table 3.4** and considered in the descriptions under each Tier level that followed and then summarised in **Table 3.9**, the information captured has sought to include:

- Proposed design and location information;
- Proposed programme of consenting, construction, operation and decommissioning; and
- Environmental assessments that set out baseline data and effects arising from the development.

3.4.81 To achieve this objective, information has been sourced from publically available information set out on project websites and/or the website of relevant local planning authorities. In most instances it was found that there was only limited publically available information to inform the assessments. This was due either to the sensitive and confidential nature of the project or the early stage that the project is currently at in its development. It is therefore acknowledged that this process will need to be repeated as more information becomes available either publically or through consultation with developers or consultees. NuGen will continue to carry out this exercise in 2016.

Stage Three

3.4.82 Stage Three of the CEA involves the assessment of the cumulative effects of the proposed Moorside Project as a whole and separately with the *"other developments"* identified through Stages One and Two.

3.4.83 For this PEIR, preliminary assessments have been undertaken and the details are set out in the relevant technical topic chapters. As such they have been undertaken commensurate with the level of information available at the time of the preparation of the PEIR. However, in line with PINS Advice Note Seventeen, in cases where information on proposals may be limited or incomplete, such gaps will be acknowledged within the assessment and the level of uncertainty in assessments will be clearly documented. A precautionary but pragmatic approach to assessment has therefore been taken based around the best available evidence or data about the environmental effects.

3.4.84 For the ES, it is anticipated that considerably more information will be available with respect to all of the developments requiring consideration in respect of the assessment of accumulated and cumulative effects to enable a more comprehensive assessment to be undertaken than is possible at this time. Such an assessment will be documented in a matrix format, such as the same as (or similar to) Matrix 2 included in Appendix 2 of PINS Advice Note Seventeen. Significance criteria for assessing the likely cumulative effects will be developed taking cognisance of the following example criteria set out in PINS guidance:

- The duration of effect;
- The extent of effect;
- The type of effect;
- The frequency of effect;
- The 'value' and resilience of the receptor affected; and
- The likely success of incorporated mitigation.

3.4.85 Where significant adverse cumulative effects are identified, appropriate additional mitigation measures may be proposed. Where possible, opportunities to develop holistic mitigation strategies in collaboration with other developers identified in the CEA will also be explored.

3.5 References

1. The Planning Inspectorate (March 2015). Advice Note Seven Environmental Impact Assessment: Preliminary Environmental Information, Screening and Scoping
2. NuGen (2015a). *Environmental Impact Assessment Scoping Report: Volume 1 Main Text*. http://www.nugeneration.com/download/Volume_1_Scoping_Report.pdf (Accessed 13 April 2016).

3. NuGen (2015b). *Environmental Impact Assessment Scoping Report: Volume 3 Survey and Monitoring Plans*. http://www.nugeneration.com/download/Volume_3%20_Survey-and-Monitoring-Plans.pdf (Accessed 13 April 2016).
4. The Planning Inspectorate (August 2015). Scoping Opinion: Proposed Moorside Development.
5. UK Government (2010). The Conservation of Habitats and Species Regulations 2010. SI No. 490. The Stationery Office, London.
6. UK Government (2007). The Offshore Marine Conservation (Natural Habitats, &c.) Regulations 2007. SI No. 1842. The Stationery Office, London.
7. The Planning Inspectorate (December 2015). Advice Note Seventeen Cumulative effects assessment relevant to nationally significant infrastructure projects