

Appendices to the Appraisal of Sustainability Site Report for Braystones

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

Appraisal of Sustainability of the revised draft Nuclear National Policy Statement

The Appraisal of Sustainability (AoS), incorporating Strategic Environmental Assessment, of the draft Nuclear National Policy Statement (Nuclear NPS) has been undertaken at a strategic level. It considers the effects of the proposed policy at a national level and the sites to be assessed for their suitability for the deployment of new nuclear power stations by 2025. These strategic appraisals are part of an ongoing assessment process that started in March 2008 and, following completion of this AoS, will continue with project level assessments when developers make applications for development consent in relation to specific projects. Applications for development consents to the Infrastructure Planning Commission will need to be accompanied by an Environmental Statement having been the subject of a detailed Environmental Impact Assessment.

The AoS/SEA Reports are presented in the following documents:

AoS Non-Technical Summary

Main AoS Report of revised draft Nuclear NPS

- Introduction
- Approach and Methods
- Alternatives
- Radioactive Waste
- Findings
- Summary of Sites
- Technical Appendices

Annexes to Main AoS Report: Reports on Sites

- Site AoS Reports
- Technical Appendices

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

This document is the Appendices to the Appraisal of Sustainability Site Report for Braystones. These appendices have been prepared by the Department of Energy and Climate Change with expert input from a team of specialist planning and environmental consultancies led by MWH UK Ltd with Enfusion Ltd, Nicholas Pearsons Associates Ltd, Studsvik UK Ltd and Metoc plc.

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Appendix 1: Sustainable Development Themes and AoS Objectives

* Note: additional decision-aiding questions to aid appraisal have been added in red text.

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
Air Quality	
12. To avoid adverse impacts on air quality	Will it result in the release of low level radionuclides that may adversely affect human health or biodiversity? Will it contribute to an increase in the number or expansion of AQMAs?
Biodiversity and Ecosystem Services	
1. To avoid adverse impacts on the integrity of wildlife sites of international and national importance 2. To avoid adverse impacts on valuable ecological networks and ecosystem functionality 3. To avoid adverse impacts on Priority Habitats and Species including European Protected Species	Will it result in the loss of habitats of international/national importance? Will it affect other statutory or non-statutory wildlife sites? Will it result in harm to internationally or nationally important or protected species? Will it adversely affect the achievement of favourable conservation status for internationally and nationally important wildlife sites? Will it affect the structure and function/ecosystem processes that are essential to restoring, securing and/or maintaining favourable condition of a feature or a site? Will the proposal enable the BAP targets for maintenance, restoration and expansion to be met? Will the proposal result in changes to coastal evolution that is otherwise needed to sustain coastal habitats? Will it result in the release of harmful substances for example oil, fuel and other pollution into waterbodies which could affect aquatic ecosystems? Will it result in the accidental migration of radionuclides which could harm aquatic or terrestrial ecosystems? Will it result in changes to stream hydrology and morphology that could affect aquatic or terrestrial ecosystems? Will it result in thermal discharges that could adversely affect aquatic ecosystems? Will it result in soil contamination that could damage aquatic or terrestrial ecosystems?
Climate Change	
13. To minimise greenhouse gas emissions	Will it take account of future effects and risks of climate change for example sea level rise? Will future changes in weather patterns be considered? Will it result in increased vehicular emissions (particularly carbon dioxide)? Will it result in increased emissions from asset construction, maintenance and demolition, waste recycling and disposal or other activities ? Note: Adaptation to climate change is discussed in other relevant topic appraisals, eg. biodiversity, water, flood risk.
Communities: Population, Employment and Viability	

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
4. To create employment opportunities 5. To encourage the development of sustainable communities 10. To avoid adverse impacts on property and land values and avoid planning blight	Will it create both temporary and permanent jobs in areas of need? Will it result in in-migration of population? Will it result in out-migration of population? Will it affect the population dynamics of nearby communities (age-structure)? Will it result in a decrease in property and land values as a result of a change in perceptions or blight?
Communities: Supporting Infrastructure	
8. To avoid adverse impacts on the function and efficiency of the strategic transport infrastructure 9. To avoid disruption to basic services and infrastructure	Will it result in changes to services and service capacity in population centres? Will it result in the direct loss of strategic road/rail/air/port infrastructure? Will it result in increased congestion/pressure on key transport infrastructure? Will it result in loss or disruption to basic services and infrastructure (for example electricity, gas)? Will it place significant pressure on local/regional waste management facilities (non-nuclear waste)?
Human Health and Well-Being	
6. To avoid adverse impacts on physical health 7. To avoid adverse impacts on mental health 11. To avoid the loss of access and recreational opportunities, their quality and user convenience	Will it adversely affect the health of local communities through accidental radioactive discharges or exposure to radiation. Will the storage of radioactive waste result in adverse physical and mental health effects for local communities? Will exposure to noise and vibration as a result of plant activities lead to physical and mental health impacts on nearby communities? Will it adversely affect the health of the workforce? Will the perceptions of adverse risk as a result of activities lead to adverse impacts on mental health for nearby communities? Will it result in the loss of recreational and amenity land or loss of access? Will it adversely affect the ability of an individual to enjoy and pursue a healthy lifestyle?
Cultural Heritage	
22. To avoid adverse impacts on the internationally and nationally important features of the historic environment. 23. To avoid adverse impacts on the setting and quality of built heritage, archaeology and historic landscapes	Will it adversely affect historic sites of international/national importance and their setting? Will it adversely affect other historic sites of known value? Will it adversely affect landscapes of historic importance?

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
Landscape	
24. To avoid adverse impacts on nationally important landscapes 25. To avoid adverse impacts on landscape character, quality and tranquillity, diversity and distinctiveness	Will it adversely affect landscapes within or immediately adjacent to a National Park? Will it adversely affect landscapes in or immediately adjacent to an AONB or NSA? Will it adversely affect Heritage Coast or Preferred Conservation Zones? Will it adversely affect local landscapes/townscapes of value? Will it affect the levels of tranquillity in an area? Will it adversely affect the landscape character or distinctiveness? Will it result in increased levels of light pollution?
Soils, Geology and Land Use	
19. To avoid damage to geological resources 20. To avoid the use of greenfield land and encourage the re-use of brownfield sites 21. To avoid the contamination of soils and adverse impacts on soil functions	Will it result in the compaction and erosion of soils? Will it lead to the removal or alteration of soil structure and function? Will it lead to the contamination of soils which would affect biodiversity and human health? Will it compromise the future extraction/ use of geological/ mineral reserves? Will it result in the loss of agricultural land? Will it lead to damage to geological SSSIs and other geological sites? Will it result in the loss of Greenfield land? Will it adversely affect land under land management agreements?
Water: Hydrology and Geomorphology	
15. To avoid adverse impacts on surface water hydrology and channel geomorphology (including coastal geomorphology)	Will it result in the increased sedimentation of watercourses? Will it adversely affect channel geomorphology? Will hydrology and flow regimes be adversely affected by water abstraction? Will it result in demand for higher defence standards that will impact on coastal processes? Can the higher defence standards be achieved without compromising habitat quality and sediment transport?
Water: Water Quality (including surface, coastal and marine)	
16. To avoid adverse impacts on surface water quality (including coastal and marine water quality) and assist achievement of Water Framework Directive objectives	Will it cause deterioration in surface water quality as a result of accidental pollution, for example spillages, leaks? Will it cause deterioration in coastal and / or marine water quality as a result of accidental pollution, for example spillages, leaks? Will it cause deterioration in surface water quality as a result of the disturbance of contaminated soil? Will it cause deterioration in coastal and / or marine water as a result of the disturbance of contaminated soil? Will it affect designated Shellfish Waters?

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
	Will it affect Freshwater Fish Directive sites? Will it increase turbidity in water bodies? Will it increase the temperature of the water in water bodies?
Water: Water Supply and Demand	
17. To avoid adverse impacts on the supply of water resources	Will it adversely affect water supply as a result of abstraction? Will it increase demand for water?
Water: Groundwater Quality and Flow	
18. To avoid adverse impacts on groundwater quality, distribution and flow and assist achievement of Water Framework Directive objectives	Will it cause deterioration in groundwater quality as a result of accidental pollution, for example spillages, leaks? Will it cause deterioration in groundwater quality as a result of the disturbance of contaminated soil?
Flood Risk	
14. To avoid increased flood risk (including coastal flood risk) and seek to reduce risks where possible	Will it result in demand for higher defence standards that will impact on coastal processes?

Appendix 2: Appraisal Matrices

Key to Appraisal				
Key to appraisal of Strategic Effects:			Abbreviations:	
Significance		Category of effect	Timescale	
++	Major Significant	Development actively encouraged as it would resolve an existing sustainability problem. Effect considered as being of national/ international significance.	C	Construction stage
+	Minor Significant	No sustainability constraints and development acceptable. Effect considered as being of national/ international significance.	O	Operation stage
0	No significance	Neutral effect	D	Decommissioning stage
-	Minor Significant	Potential sustainability issues; mitigation and / or negotiation possible. Effect considered as being of national/ international significance.	Likelihood	
--	Major Significant	Problematical because of known sustainability issues; mitigation or negotiation difficult and/ or expensive. Effect considered as being of national/ international significance.	H	High Likelihood
?	Uncertainty	Where the significance of an effect is particularly uncertain, for example because insufficient information is available at the plan stage to fully appraise the effects of the development or the potential for successful mitigation, the significance category is qualified by the addition of '?'	M	Medium Likelihood
			L	Low Likelihood

Note: Separate appraisal matrices have been completed for each AoS objective under the Water Quality and Resources topic but the findings are presented in an aggregated appraisal under Water Quality and Resources in the site report.

Air Quality
<p>AoS Objective:</p> <p>12. To avoid adverse impacts on air quality</p> <p>Guide questions:</p> <p>Will it result in the release of low level radionuclides that may adversely affect human health or biodiversity? Will it contribute to the degradation of air quality – both local and transboundary?</p>
Potential Receptors:
<ul style="list-style-type: none"> • Local populations and wider regional population (human health) • Sensitive habitats, including Hallsenna Moor National Reserve and SSSI; Drigg Coast SAC and SSSI; plus Haile Great Wood, Black Moss, Drigg Holme, Florence Mine, Low Church Moss, and Silver Tarn, Hollas and Harnsey Mosses SSSIs
Potential Significant Effects and Mitigation Possibilities:
<p>International/ National/ Transboundary</p> <ol style="list-style-type: none"> 1. The release of non-radioactive gaseous emissions during construction and operation is not likely to have a strategically significant effect, as effects from construction and operation will be localised (see regional/local appraisal below) and controlled through appropriate regulatory regimes and consents/permits and management techniques during construction, operation and decommissioning stages. 2. However, there is potential for release of radioactive emissions, planned and accidental, during the operation and decommissioning of a new nuclear power station and interim radioactive waste storage on the site. The prevailing wind direction is south to south-westerly through the year. Although the prevailing wind direction could cause any emissions to be dispersed over the Irish sea, in extreme circumstances (both in terms of releases and meteorological conditions) there is a potential for transboundary effects, in particular the Isle of Man and the eastern coastline of Ireland. The potential effects of release of radiation are discussed in the main AoS report, however detailed modelling will be required and considered as part of the HSE and Environmental Regulators' risk assessment as carried out for the consenting process. There is, however, an opportunity to employ any lessons learned from the decommissioning of the nearby existing Sellafield nuclear power facility (currently ongoing).

Air Quality						
<p>3. There is a small risk that increased concentrations of airborne pollutants or nutrients could have an adverse effect on adjacent sites of nature conservation interest. Any accidental or planned release of radioactive emissions may also affect sensitive ecosystems. This is discussed further in the Biodiversity and Ecosystem Sections.</p>						
Regional/ Local						
<p>4. Air quality in the North West is generally good. Emissions to air from major industrial sites have reduced substantially, however emissions from traffic sources (major route corridors and areas of congestion) are continuing to cause pressures on local air quality across the region. No Air Quality Management Areas (AQMAS) have been declared in the Copeland Borough Council region. The effect on air quality from the development is not likely to be significant, provided construction and operation is in accordance with regulatory/consenting regimes.</p> <p>5. It is unlikely that the development project will lead to the designation of any new AQMAS in the region due to the duration of construction and operational activities.</p> <p>6. As with any major infrastructure project, the emission of pollutants to the atmosphere associated with transport and the generation of fine particulates and dust during construction have the potential for local nuisance and impacts on health within a zone of influence from the construction site. Air pollution can be minimised and controlled through working in accordance with good site environmental practices and managed through the use of Construction Environmental Management Plans.</p> <p>7. The release of radioactive emissions from the site will be governed by HSE and the Environmental Regulator through the development of appropriate discharge limits, as part of the authorisation under the Environmental Permitting (England and Wales) Regulations 2010. This will be specific to the reactor type being used, alongside the siting and sensitivity of the receiving environment.</p> <p>8. There is a small risk that increased concentrations of airborne pollutants or nutrients could have an adverse effect on adjacent sites of nature conservation interest. Any accidental or planned release of radioactive emissions may also affect sensitive ecosystems. This is discussed further in the Biodiversity and Ecosystem Sections.</p>						
Summary of Significant Strategic Effects:			Timescale	C	O	D
			Significance	-	- ?	- ?
			Likelihood	M	L	L
Significant Effects				Mitigation and Monitoring Possibilities		

Air Quality

- | | |
|--|--|
| <ul style="list-style-type: none">• Release of non-radioactive emissions is unlikely to have a strategically significant effect on air quality• There is a small risk that increased concentrations of airborne pollutants or nutrients could have an adverse effect on adjacent sites of nature conservation interest.• Release of radioactive emissions (planned and accidental) can have a significant strategic effect on air quality, including transboundary effects. The HSE and Environmental Regulator will consider this as part of the HSE and Environmental Regulators risk assessment carried out as part of the consenting process and must be satisfied risk to public health and safety is within acceptable limits. | <ul style="list-style-type: none">• Please refer to mitigation measures contained in the Biodiversity and Ecosystems Sections.• Release of radioactive emissions controlled through regulatory process and risk assessment undertaken for consenting process. |
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Biodiversity and Ecosystems

AoS Objective:

1. To avoid adverse impacts on the integrity of wildlife sites of international and national importance.
2. To avoid adverse impacts on valuable ecological networks and ecosystem functionality.
3. To avoid adverse impacts on Priority Habitats and Species including European Protected Species.

Guide questions:

Will it result in the loss of habitats of international/national importance?

Will it affect other statutory or non-statutory wildlife sites?

Will it result in harm to internationally or nationally important or protected species?

Will it adversely affect the achievement of favourable conservation status for internationally and nationally important wildlife sites?

Will it affect the structure and function/ecosystem processes that are essential to restoring, securing and/or maintaining favourable condition of a feature or a site?

Will the proposal enable the BAP targets for maintenance, restoration and expansion to be met?

Will the proposal result in changes to coastal evolution that is otherwise needed to sustain coastal habitats?

Will it result in the release of harmful substances for example oil, fuel and other pollution into waterbodies which could affect aquatic ecosystems?

Will it result in the accidental migration of radionuclides which could harm aquatic or terrestrial ecosystems?

Will it result in changes to stream hydrology and morphology that could affect aquatic or terrestrial ecosystems?

Will it result in thermal discharges that could adversely affect aquatic ecosystems?

Will it result in soil contamination that could damage aquatic or terrestrial ecosystems?

Potential Receptors:

Designated Sites

- Silver Tarn, Hollas and Harnsey Mosses SSSI – immediately adjacent of the nominated site, to the north-west.
- Low Church Moss SSSI
- Haile Great Wood SSSI
- Black Moss SSSI
- St. Bees Head SSSI
- Drigg Coast SAC/SSSI
- River Ehen SAC and River Ehen (Ennerdale Water to Keekle Confluence) SSSI
- Hallsenna Moor SSSI
- Florence Mine SSSI – a geological SSSI (now destroyed)

Biodiversity and Ecosystems

- Wast Water SAC
- River Derwent and Bassenthwaite Lake SAC

Habitats considered to be potential receptors are as follows:

- Estuaries (which contain a number of UK BAP priority habitats such as mudflats, sandflats and saltmarsh)
- Coastal Sand Dunes
- Rivers
- Lowland Heathland
- Lowland Fens
- Standing Waters

Species which may be potential receptors include:

- Amphibians; including Great Crested Newt (EPS) and the Natterjack Toad (EPS)
- Breeding birds within the locality, including sea bird populations associated with St. Bees Head SSSI
- Common species of reptile
- Otters (EPS)
- Bats (EPS)
- Rare and uncommon plants
- Nationally important invertebrate species, including Freshwater Pearl Mussel
- Fish species, such as Atlantic Salmon and Lamprey (EPS)

**EPS = European Protected Species*

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

Disturbance (noise, light and visual)

1. Potential significant effects may arise due to disturbance from construction activities (duration 5-6 years), increased vehicular movements, machinery, earthworks and excavations, an increase in lighting and increased personnel presence on the site. Similar impacts could also occur during decommissioning. This could have an adverse impact on fauna within the immediate locality of the site. The nominator will need to assess the potential

Biodiversity and Ecosystems

for disturbance effects on fauna, especially on any European Protected Species and devise appropriate mitigation to avoid or minimise such effects on protected species.

Loss, damage and fragmentation of important habitats and species

1. Construction activities, earthworks and excavations and provision of new buildings and infrastructure could all result in the direct loss, damage, reduction, alteration or fragmentation of important priority habitats as listed in the UK Biodiversity Action Plan and Cumbria Biodiversity Action Plan. In particular construction may lead to potential damage to the Silver Tarn, Hollas and Harnsey Marshes SSSI, which lies directly adjacent to the site, and strict measures would be required in order to avoid such harm, Potential impacts on important habitats/species will need to be investigated further (both the site level and within the wider area). Mitigation will need to avoid or minimise any loss with appropriate measures defined in the nominator's proposals and Environmental Impact Assessment (EIA). Further studies¹ would be required to determine a baseline for the prediction of the effects of developing the nominated site on any habitats/species so that suitable mitigation measures can be implemented. Protected species likely to occur in the area include Great Crested Newts, Natterjack Toad, other common amphibian species, common reptile species, breeding birds, bats, Otter and invertebrate species.

Water Resources and Quality

2. Discharge of heated water into waterbodies can impact upon aquatic ecosystems due to the temperature of the water being up to 10°C warmer. Any discharge of heated water into the Irish Sea and through to the adjacent River Ehen system could have an adverse impact on the habitats and species for which the upstream River Ehen SAC and SSSIs sites are designated, for example oxygen is less soluble in water at higher temperatures and a reduction in dissolved oxygen can put aquatic life under stress. Any loss of habitats/plants or invertebrates could in turn have an impact on other species which rely on such sources for feeding. Further studies will be required by the nominator to assess the effects of discharged heated water on aquatic ecology especially any effects which could impact on the River Ehen SAC, River Ehen (Ennerdale Water to Keekle confluence) SSSI, Wast Water SAC, River Derwent and Bassenthwaite SAC and their interest features.
3. Water intake from surface water bodies can lead to the incidental mortality of fish and other aquatic species. Fish, larvae and eggs can be sucked into condenser circuits and be subjected to heat before being returned to the sea. There is therefore the potential for impacts on Atlantic Salmon and secondary effects on the Freshwater Pearl Mussel population of the River Ehen SAC and River Ehen (Ennerdale Water to Keekle confluence) SSSI, as the mussels are dependent on the salmon in a key stage in its life-cycle. There could also be impacts on Wast Water SAC and River Derwent and Bassenthwaite SAC and their qualifying features. St. Bees Head SSSI is also within close proximity to the nominated site, and any loss of fish food sources could have an adverse impact on important seabirds associated with this site. A suitable intake system design should be adopted to avoid any

¹ Where it is stated further studies are required this is in reference to further studies to be carried out by the nominator at the EIA stage.

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significant ecological impacts.

4. Cooling water may be sourced from the Irish Sea. As such, the inlet and outlet pipes may have impacts on biodiversity in relation to altering coastal processes and accelerated erosion. Other off-shore infrastructure, such as marine off-loading facilities may also affect coastal processes, and impact on habitats and fauna, such as Sabellaria reefs, marine turtle migrations and fish migration routes (for example Atlantic Salmon and Lamprey species) along the coastal strip.
5. Groundwater abstractions may affect groundwater supply to other areas hydrologically linked to the nominated site, this could result in habitat degradation further afield. Silver Tarn, Hollas and Harnsey Mosses SSSI is located immediately north-west of the nominated site and Low Church Moss SSSI lies approximately 0.8km to the south-east. These areas contains habitats such as wet heath, marshy grassland, fen, swamp and mire, which could be vulnerable to groundwater extraction. Haile Great Wood SSSI (ancient woodland, 3.5km to the north-east), Black Moss SSSI (lowland raised bog some 4km to the north-east) and Hallsenna Moor SSSI (a lowland heathland and peatland complex, 8km to the south-east), are considered potentially vulnerable to changes in groundwater, but may be less likely to be affected due to distance. Further hydrological studies will be required by the nominator to assess the effects of any proposed water abstraction on ecology, particularly wetland habitats, Drigg Coast SAC/SSSI, Wast Water SAC and River Derwent and Bassenthwaite SAC, which may be vulnerable to groundwater abstraction.
6. New drainage systems on or within the nominated site could result in adverse impacts on both terrestrial and aquatic habitats during both construction and operation. Installing new drainage systems could result in physical loss of habitats and new operating drainage systems may result in increased sediment loading of watercourses/estuarine habitats and altered run off rates. This could affect the hydrology and morphology of watercourses/estuarine habitats and could impact on aquatic flora and fauna. In addition nutrient enrichment could alter the composition of habitats within aquatic ecosystems. Further hydrological studies will be required by the nominator to assess the effects of any drainage infrastructure on local ecology, particularly aquatic habitats and/or areas of valuable habitat such as those associated with Silver Tarn, Hollas and Harnsey Mosses SSSI, Low Church Moss SSSI, the Drigg Coast SAC/SSSI and River Ehen SAC/SSSI.
7. Routine radioactive discharges to the aquatic environment may have a negative impact on both terrestrial and aquatic ecology. Depending on dosage lethal, genetic or reproductive effects may result. Radionuclides may also accumulate in organisms such as invertebrates and plants which could have both direct and indirect effects, in particular on the Drigg Coast SAC/SSSI, River Ehen SAC/SSSI, Wast Water SAC, River Derwent and Bassenthwaite SAC and St. Bees Head SSSI and their interest features such as the important bird assemblages and Freshwater Pearl Mussel. There is also potential that radionuclides will be transported over considerable distances through the Irish Sea to affect marine and aquatic ecology in Ireland and South West Scotland. Further studies will be required to understand fully the extent and likely significance of effects on ecology of any proposals for radioactive discharges from the nominated site. Any new nuclear power stations would require authorisation from the relevant environment agency under the Environmental Permitting (England and Wales) Regulations 2010 before making any discharges of radioactivity and regular water quality monitoring will be required.

Biodiversity and Ecosystems

8. There is a very small risk of accidental release of radiation (either through the air, water or soil) into the environment which could affect aquatic or terrestrial fauna or flora associated with the Drigg Coast SAC/SSSI, River Ehen SAC/SSSI, West Water SAC, River Derwent and Bassenthwaite SAC, as well as biodiversity in the area as a whole. Such an event could occur during operation, interim radioactive waste storage, during decommissioning or during final transport of waste for disposal. There is also the potential for accidental pollution of watercourses due to leaks or spillages from water treatment plants. This could cause toxic contamination of aquatic or terrestrial ecology. Given the proximity of the Drigg Coast SAC/SSSI and River Ehen SAC/SSSI, key interest features of these designated sites could be impacted, for example contaminants could have lethal effects or sub-lethal effects on aquatic organisms impairing reproduction, physiology, genetics and health, or compounds could be bioaccumulated within tissues and could subsequently enter the food chain. The operation of the nominated site including waste storage, and decommissioning activities and the transport of radioactive waste, will be subject to strict regulatory controls which aim to minimise such risks, and the likelihood of any effect is considered low. Further studies are likely to be required to assess the risks and potential effects of the occurrence of such events on the designated sites and on biodiversity in the wider area as a whole and regular monitoring of water quality will be required.
9. Impacts of climate change regarding reduced summer surface water availability, increased/unpredictable fluvial flooding and sea level rise may impact on diversity, and need to be considered.

Cumulative effects

10. The North West region could be a focus for a number of potential high profile projects involving both nuclear and renewable energy options, the cumulative effects of which could be significant to the overall impacts on biodiversity.

Air quality

11. The development of the nominated site may affect air quality. In particular through construction activities (duration 5-6 years) and as a result of increased vehicular movements, both within the nominated site itself and via increased traffic on access roads to and from the development. Increased vehicular emissions and mobilisation of dust could both impact on the sensitive habitats of the Drigg Coast SAC/SSSI, Silver Tarn Hollas and Harnsey Marshes SSSI, and Low Church Moss SSSI, as well as biodiversity in the general locality, particularly if the dust is of a different acidity to the surrounding habitats. Further background environmental condition information and modelling is likely in order to predict potential impacts of changes in air quality on biodiversity.

Regional/ Local

Water Resources and Quality

12. During construction, operation and decommissioning there is a risk of adverse impacts to flora and fauna through accidental pollution (for example

Biodiversity and Ecosystems

spillages of oil, fuel or other contaminants) which could affect terrestrial or aquatic habitats on or near to the site. Further studies should be undertaken by the nominator to assess the effects of any pollution on local biodiversity. Good site environmental management practices should be put in place to minimise the above risks.

Loss, damage and fragmentation of important habitats and species

13. Impacts on the internationally and nationally designated sites have been considered above. Development of the site could also have adverse impacts on important habitats, such as BAP habitats, and legally protected/BAP species within or immediately adjacent to the development footprint. It is unknown at the present time what habitats and species are present at a local level. Further site level studies will need to be undertaken by the nominator to determine a baseline for predicting the effects of developing the site on habitats and species so that appropriate mitigation measures can be implemented.
14. Opportunities for on/off site habitat creation and enhancement may exist leading to biodiversity benefits and possibly assisting with flood risk management.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	--?	--?	--?
Likelihood	M	M	M

Significant Effects

Loss, damage and fragmentation of important habitats and species

- Noise, visual and light disturbance during construction on fauna such as legally protected species.

Mitigation and Monitoring Possibilities²

- Minimise need for encroachment of construction into sensitive areas through site design.
- Construction Environmental Management Plan to minimise disturbance. For example through timing, visual/noise screening.

² Appropriate mitigation will be defined in detail during the EIA process for the site.

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| <ul style="list-style-type: none"> • Loss, damage or alteration of important habitats, including adjacent Silver Tarn, Hollas and Harnset Marshes SSSI, and subsequent disturbance to protected species (through severance of wildlife corridors) due to new buildings and infrastructure.
 • Water Resources and Quality
 • Discharge of heated water into aquatic habitats could alter ecosystems.
 • Abstraction of water for cooling purposes can lead to incidental mortality of fish and aquatic invertebrates, and potential effects on the River Ehen SAC/SSSI, Wast Water SAC and River Derwent and Bassenthwaite SAC.
 • Groundwater abstraction can alter important habitats reliant on groundwater supplies, including internationally and nationally designated sites.
 • Routine releases of radioactive discharges into water could impact aquatic ecosystems either directly or indirectly, for example through bioaccumulation of toxins within food chains.
 • Accidental pollution from for example, leakage of radioactive waste or other chemical compounds. Such risks are present throughout construction, operation and decommissioning.
 • Construction and operation of new drainage infrastructure could impact on both terrestrial and aquatic ecosystems, including designated sites, particularly the adjacent Silver Tarn, Hollas and Harnsey Marshes SSSI.
 • Improper management of materials during construction, operation and decommissioning could lead to contamination of soil, water and air through leakages and spills. This in turn could have adverse impacts on local biodiversity. | <ul style="list-style-type: none"> • Avoid or minimise losses through site layout design.
 • Habitat creation to replace lost habitats and maintain connectivity of wildlife corridors around the site.
 • Ecological mitigation and management plan, informed by further site level baseline surveys.
 • Further studies necessary to determine impact.
 • Incorporation of fish protection measures within cooling water intake/system design.
 • Further studies necessary to determine impact.
 • Further studies required to determine impact. Avoid impacts through safe site operation and regular water monitoring.
 • Further studies required to determine impact. Avoid impacts through safe site operation, decommissioning and waste transfer.
 • Regular monitoring of water quality.
 • Avoid through safe materials management practices guided by an Environmental Management Plan.
 • Construction Environmental Management Plan to minimise impacts. |
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Biodiversity and Ecosystems

Air Quality

- Reduction in air quality, particularly due to increased dust and vehicle emissions, could have potential impacts on local biodiversity, and nationally and internationally designated sites.

Climate Change

AoS Objective:

13. To minimise greenhouse gas emissions

Guide questions:

Will it result in increased vehicular emissions (particularly carbon dioxide)?

Will the development result in an overall reduction in greenhouse gas emissions over its life time resulting from changes in:

- Transport of people and goods
- Scope, form and methods of asset construction, maintenance and demolition
- Waste recycling and disposal
- Land management practices
- Other secondary activities in the wider local and national economy

Note: Adaptation to climate change is discussed in other relevant topic appraisals, eg. biodiversity, water, flood risk.

Potential Receptors:

- Human population and environment at all geographical scales.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. There are national and international potential effects of changes in greenhouse gas emissions as a result of a new nuclear power station on the nominated site, particularly when combined with a wider nuclear programme. The benefits of low carbon emissions from the operation of nuclear power stations independent of the site chosen are considered in the overarching AoS report. Emissions during the operational phase of the power station are significantly lower than that of any non-nuclear (conventional fossil fuel-powered) facility delivering equivalent power output.
2. During the operational phase, the carbon footprint is similar to that of wind power with equivalent output but with significantly less land or area coverage. This consideration is independent of any life-cycle (embodied) carbon emission analysis, which is currently outside the scope of this study.
3. Although the effects of any emissions will be felt globally, the emissions during construction and decommissioning will largely be determined by regional and local factors (for example local transport infrastructure and how the location of the site will affect transport emissions).
4. Construction and decommissioning activities will have both direct and indirect greenhouse gas emissions regardless of the location of the nuclear power plants. A comparison of these construction and decommissioning related emissions to those of fossil-fuelled power plants will largely depend upon the design parameters of such plants, with the exception of specific sub-activities associated with nuclear fuel and nuclear wastes.

Climate Change

Regional/Local

5. The provision of a nuclear power station for energy generation at the site will make a positive contribution to the objective of the Cumbria Climate Change Strategy to incorporate carbon reduction as a requirement of public sector investment decisions and procurement, when compared to some other sources of energy. The combination of nuclear power generation with increased investment in renewable energy sources will assist in reducing greenhouse gas emissions compared to a non nuclear power facility option. The Cumbria Climate Change Strategy states concerns which include the lack of grid connections, grid instability and the distance from the location of energy demand.
6. The activities involved in the construction of the plant are likely to have a negative impact on targets for reductions in carbon from transport and construction plant. The materials incorporated in the plant will also contribute to levels of embodied carbon in the region. The extent will depend upon the methods of transport and construction adopted and on the types and quantities of materials incorporated in the plant. Another option for transportation to consider will be the use of the current rail infrastructure in place. The indirect impacts associated with the construction phase could be higher in totality than the emissions of the construction activity itself. These include the influx of labour population, increased population vehicular usage, transport of materials, higher demand on utilities. This will fit well with the Cumbria's strategy. The potential for coastal erosion and flooding as two of the climate change impacts may have consequences on the stability of the railway line stretching from Seascale station to the south to St Bees station to the north. This stretch of railway is in very close proximity to the shoreline.
7. Energy and climate change impacts from decommissioning the plant at the end of its life are not sensitive to the site location other than the distance that will be required to transport nuclear waste to any long-term waste geological depository facility. The means of disposing of nuclear waste, including spent fuel, from new nuclear power stations is being considered as part of the Government's programme for Managing Radioactive Waste Safely.
8. The site is situated in a region susceptible to the following impacts :
 - 20% decrease in summer rainfall over the last century
 - Increase in high intensity rainfall since the 1960s
 - Seasonal rainfall varying by as much as 15% from the average in the last 30 years
 - Increased flooding of some of the region's major rivers in the last few decades
9. Cumbria is a relatively large emitter of CO₂ per capita, due largely to having a large land mass and sparse population. Rural populations are heavily reliant on private vehicles as the primary source of transport, and in the more rural areas of the county there is an over reliance on oil/coal for domestic heating

Climate Change				
Summary of Significant Strategic Effects:	Timescale	C	O	D
	Significance	-	++	-?
	Likelihood	M	H	? ?
<p>Significant Effects</p> <ul style="list-style-type: none"> The reductions in greenhouse gas emissions due to the operation of nuclear power plants compared to alternative fossil fuel sources of energy will have positive long term effects during the operational stage and longer term. The cumulative benefits of a nuclear programme for climate change are further discussed in the main AoS report. This site is susceptible to the future impacts of climate change associated with coastal erosion, sea level rise, flooding and drought. Of these coastal erosion and sea level rise are most likely to affect the latter half of the site's operational phase and the site's decommissioning phases. These effects will be addressed in detail in the section associated with Flood Risk. Locating a new nuclear power station on this site could have a positive multiplier effect on the further investment and implementation of renewable (low carbon) energy sources in the region. Construction activity will produce an increase in greenhouse gas emissions, but will make only a relatively small addition to the regional inventory of emissions in comparison to the low carbon energy output of the power station. This is discussed in the main AoS Report. The operational phase of a new nuclear power station is likely to have a far lower carbon footprint compared to those of fossil-fuel powered stations providing similar power output. The Cumbria Climate Change Strategy has stated the following concerns: lack of grid connections, grid instability and the distance from the location of energy demand. 	<p>Mitigation and Monitoring Possibilities</p> <ul style="list-style-type: none"> Appropriate sea and coastal defence measures (see the Flood Risk section of this appendix) The impacts during construction may be mitigated by selection of carbon-efficient forms of transport and construction. There is also the possibility of offsetting the emissions. The greenhouse gas emissions arising from construction and operation should be monitored to inform carbon reduction through the lifetime of the project. Further enhancement of electrical transmission systems, road and rail systems could be co-ordinated and integrated in such a way as to minimise greenhouse gas emissions. 			

Communities: Population, Employment and Viability	
AoS Objective:	
4. To create employment opportunities.	
5. To encourage the development of sustainable communities	
10. To avoid adverse impacts on property and land values and avoid planning blight	
Guide questions:	
Will it create both temporary and permanent jobs in areas of need?	
Will it result in in-migration of population?	
Will it result in out-migration of population? Will it affect the population dynamics of nearby communities (age-structure)?	
Will it result in a decrease in property and land values as a result of a change in perceptions or blight?	
Potential Receptors:	
<ul style="list-style-type: none"> • Local and regional resident workforce • Local and regional population 	
Potential Significant Effects and Mitigation Possibilities:	
International/ National/ Transboundary	
No significant effects identified at this scale.	
Regional/ Local	
1. Short-medium term positive effects through creating new jobs for local and regional population, across the range of ages and functions. The quality and quantity of employment during the construction stages (approx 5- 6 years) of the reactor will differ to the operational stage (approx 60 years),	

Communities: Population, Employment and Viability

where longer-term employment will lead to quality of life benefits. Labour requirements will tail-off towards the end of the operational stage; however decommissioning will still require significant levels of labour for a minimum of 30 years. The significance of the effect is greater at the local level, whereas at the regional level this is of minor significance, as jobs are absorbed into regional employment figures.

2. The existing site at nearby Sellafield is a significant local employer, employing approximately 10,500 staff³. A new nuclear power station at the nominator site a short distance to the north may assist in offsetting job-losses from the decommissioning of the existing power stations at the Sellafield site - however it is noted the time differences between decommissioning (estimated to be complete by 2040) and construction of any new reactor may require employees to seek employment elsewhere.
3. Positive effects through the provision of training, education and upskilling for employees and contractors in the region. Strategic alliances can be formed with local educational establishments.
4. Positive multiplier effects (for both nuclear-related industry and wider industry as a result of increased demand from an incoming population). Of greater significance at the local level.
5. Some uncertainty is identified as the construction may affect the ability of other industries/projects to source labour, for example for house-building in the region, and other major construction projects, however, construction output is forecast to grow at a weak average annual rate of 0.2% between 2009 and 2013, slower than the national average.
6. Likely changes to the population dynamics of local communities - with potential positive and negative effects. Effects dependent on source of labour, for example from local community or outside. Possible negative effects during construction stage as a temporary new community (construction labour) may not integrate with existing community. Longer term, new employees likely to be drawn from a wide area, including local communities and the wider area generally up to 40km radius, with less pressure on local services. Positive economic and social benefits likely as new population will require new services and facilities and will help to support existing services. Influx of more affluent workers may mask existing deprivation.
7. Potential for adverse effects on property values within close proximity to the site. Mitigation possible. No evidence to suggest significant effects beyond immediate site surrounds.

³ <http://www.nda.gov.uk/documents/loader.cfm?url=/commonspot/security/getfile.cfm&pageid=4007>

Communities: Population, Employment and Viability						
Summary of Significant Strategic Effects:			Timescale	C	O	D
			Significance	+?	+ ?	0
			Likelihood	H	H	M
Significant Effects <ul style="list-style-type: none"> Strategic effects are considered minor positive with regard to the creation of temporary jobs during construction and permanent full-time employment during operation, although some uncertainty identified as the project may lead to a shortage of local construction workers to meet the needs of other industries and major projects. 			Mitigation and Monitoring Possibilities <ul style="list-style-type: none"> Consideration may need to be given to potential negative effects/difficulties in sourcing labour and the effects of this on the local/regional construction industry. 			

Communities: Supporting infrastructure
<p>AoS Objective:</p> <p>8. To avoid adverse impacts on the function and efficiency of the strategic transport infrastructure 9. To avoid disruption to basic services and infrastructure</p> <p>Guide questions:</p> <p>Will it result in changes to services and service capacity in population centres? Will it result in the direct loss of strategic road/rail/air/port infrastructure? Will it result in increased congestion/pressure on key transport infrastructure? Will it result in loss or disruption to basic services and infrastructure (for example electricity, gas)? Will it place significant pressure on local/regional waste management facilities (non-nuclear waste)?</p>
Potential Receptors:
<ul style="list-style-type: none"> • Local and regional population • Existing transportation and service infrastructure • Existing waste management infrastructure
Potential Significant Effects and Mitigation Possibilities:
<p>International/ National/ Transboundary</p> <ul style="list-style-type: none"> • There is potential for negative effects on local and strategic road infrastructure through increased congestion/disruption of traffic on the A595(T), particularly north of the site towards Whitehaven where traffic is known to travel slowly during peak periods. In addition, some local settlements along the A595(T) and nearby may be negatively impacted as a result of the construction, operation and decommissioning traffic, for example, affecting access to local services. An increase in accident rates, involving both to vehicles and pedestrians, may also arise resulting in a measurable human health effect. Notwithstanding this, the effect of a new nuclear power station at this site on the local road network can likely be mitigated, throughout all

Communities: Supporting infrastructure

stages of the development, through transportation plans, green travel plans, road safety improvements and consideration of alternatives to road, such as the existing coastal rail line or sea transport, for the transport of aggregates and other construction materials.

Regional/ Local

1. Non-nuclear construction waste will need to be further considered once details are available, including the volume and type of waste likely to be produced and transportation routes.
2. Capacity of the regional infrastructure that exists at the particular lifecycle stage of the facility will need to be considered to ensure sufficient planning of the management of wastes generated. Implementation of current good practice and initiatives will assist in minimising impacts on existing waste facilities. Such initiatives include the preparation of a Construction Waste Management Plan during the construction stage, and sustainable waste management/minimisation during operation.
3. As with the operation of any medium to large industrial facility, there is the potential for accidental releases of non-radiological, but hazardous, wastes (such as waste oils and lubricants) during the operational and decommissioning phase of the facility that can impact on habitats and species, including wintering birds, and migratory fish. It is anticipated any effects will be local however and not strategic: implementation of sustainable management techniques during these phases will reduce the risk of any such releases.
4. Operational waste (non-radiological), including those classed as hazardous (waste oils, lubricants etc) will have impacts upon the capacity of existing waste management services. Any such impacts are however not expected to be significant.
5. It is not likely that significant impacts on the current waste management infrastructure will be caused by non-radiological wastes generated during the decommissioning phase of the facility. Best practice and statutory obligations at the time of the process shall be implemented to ensure a sustainable approach is taken to the management of the wastes generated and protect the wider environment (local air quality and amenity). There is however an opportunity to employ any lessons learned from the decommissioning of the nearby existing Sellafield nuclear power facility (currently underway).
6. Long term pressures and effects on the non-radiological waste management infrastructure are unlikely to be significant.
7. The development of a nuclear power station at Braystones may require new power lines to be built, or existing lines to be upgraded, to connect the facility with the National Grid.

Communities: Supporting infrastructure							
Summary of Significant Strategic Effects:				Timescale	C	O	D
				Significance	-?	-?	-?
				Likelihood	M	M	M
<p>Significant Effects</p> <ul style="list-style-type: none"> • Potential for significant effects on strategic road infrastructure through increased congestion/ disruption of traffic. This may lead to increased congestion during construction, operation and decommissioning stages. • Potential for negative effects on local access road network due to transport of large loads during construction <i>via</i> minor country roads. 	<p>Mitigation and Monitoring Possibilities</p> <ul style="list-style-type: none"> • Further studies will be required to assess in detail the effects on the strategic road network as well as local access roads. • Appropriate mitigation measure to reduce the effects of transportation could include a Transport Management Plan (construction and decommissioning) and Green Travel Plan (construction, operation and decommissioning). Consideration of alternatives to road for the transport of large loads (for example transport by rail). 						

Human Health and Well-being

AoS Objective:

- 6. To avoid adverse impacts on physical health.
- 7. To avoid adverse impacts on mental health.
- 11. To avoid the loss of access and recreational opportunities, their quality and user convenience.

Guide questions:

- Will it adversely affect the health of its workforce or local communities through accidental radioactive discharges or exposure to radiation during construction, operation, decommissioning and interim storage of radioactive waste on the site?
- Will it lead to unacceptable community disturbance during construction, operation or decommissioning?
- Are there any particularly vulnerable local communities that could be affected?
- Will it help to reduce any health inequalities?
- Will local perceptions of risk associated with the proposed new nuclear power station lead to adverse impacts on mental health for nearby communities?
- Will it adversely affect the ability of an individual to enjoy and pursue a healthy lifestyle?

Potential Receptors:

- Temporary local and regional resident workforce during construction and decommissioning phases.
- Permanent and temporary workforce during site operational phase.
- Local and regional resident population, visiting tourists and recreational users.
- National and international resident population.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. National and transboundary health risks: There is a potential for any radioactive material discharged from the site to travel both nationally and internationally (for example to the Republic of Ireland). However, current radiological monitoring of the nuclear power stations and other nuclear installations at the nearby Sellafield site (see Appendix 4), suggests that the risk to the public is low with total dosage from all sources (including direct radiation) estimated as being less than 38% of the limit specified in the Ionising Radiations Regulations 1999. With regard to transboundary effects, there is a requirement under Article 37 of the Euratom Treaty for the United Kingdom, before plant authorisation can be granted, to submit its assessment of the likely effects to a panel of European experts who decide whether contamination of the water, soil or airspace of another Member State is likely to take place.

Human Health and Well-being

2. **Exposure Limits:** The radiation to which members of the public are exposed by the operations of a nuclear power station is limited to 1 mSv per year.⁴ This limit applies to all members of the public, including those who receive the highest doses as a result of the location of their homes and their habits of life. It also applies to the cumulative effects of planned exposures from all sources of radiation, excluding medical exposures of patients and natural background radiation. This will need to be taken into account when planning all future power plants in terms of their size, design, position and allowed emissions and discharges. Therefore, the exposures of people living near to a new nuclear power stations have to be less than the dose limit taking into account exposures from any other nearby sites and any past controlled releases. This statutory dose limit is reinforced by the concept of ALARP (As Low As Reasonably Practicable), which is used by the nuclear regulators to reduce doses to as low as is reasonably practicable

Regional/ Local

3. **Health impacts from routine discharges:** The strict regulatory framework, to restrict both routine discharges from nuclear power stations and direct radiation exposures to workers and the general public, should reduce potential health impacts to acceptable levels and ensure that radiation doses are well within internationally agreed limits. The relevant regulators, by means of a statutory authorisation procedure, will require the operators of nuclear plants to ensure that the exposure of workers and the public to radioactivity from nuclear sites is kept below stringent legal limits which are as low as is reasonable achievable. This system of regulation should ensure that the permitted discharges from the proposed nuclear power station at Braystones do not cause unacceptable risk to health.
4. **Transmission Lines:** It is possible that the proposed power station will require additional electricity transmission lines to link its output to the national grid system. Given the current uncertainty regarding the health effects of prolonged low level exposure to electromagnetic fields (EMFs) it is recommended that, in keeping with Health Protection Agency advice, a precautionary approach is adopted to the routing of any required power lines.
5. **Risk of accident – unplanned release of radiation:** During the operation of the nuclear power station, there is a risk of unplanned release of radiation into the environment leading to adverse health impacts. However, the risk of such an accident is very small because of the strict regulatory regime in the UK (referred to above) and the generic design assessment being carried out by the Health and Safety Executive (HSE). This assessment, and the Executive's input into the nuclear site licensing regime, is designed to ensure that several levels of protection and defence are provided against significant faults or failures, accident management and emergency preparedness strategies are prepared and that all reasonably practicable steps have been taken to minimise the radiological consequences of an accident.
6. **Risk of accident – transport of nuclear material:** The transportation of nuclear materials to and from the site increases the possibility of an accident with

⁴ This is through the Ionising Radiations Regulations 1999 <http://www.statutelaw.gov.uk> (which includes all activities carried out under a nuclear site licence granted by the Nuclear Installations Inspectorate under the Nuclear Installations Act 1965) http://www.opsi.gov.uk/RevisedStatutes/Acts/ukpga/1965/cukpga_19650057_en_1, the Radioactive Substances Direction 2000 <http://www.defra.gov.uk/ENVIRONMENT/radioactivity/government/legislation/pdf/rsd2000.pdf> and the Radioactive Substances (Basic Safety Standards) (Scotland) Regulations 2000 <http://www.opsi.gov.uk/legislation/scotland/ssi2000/20000100.htm>

Human Health and Well-being

radiological consequences. However, the safety record for the transport of nuclear material suggests that the risks are very low. Data from the Radioactive Materials Transport Event Database (RAMTED) for the period 1958 to 2006 showed that of the recorded 850 events associated with the transport of radioactive materials no 'significant dose events' were associated with the nuclear power industry. Rather all nineteen recorded significant dose events involved the transport of industrial radiography sources that were moved without the source being properly returned to the container.

7. Health services: There is a possibility that the influx of workers required for the construction and operational phases of the proposed new power station may put a strain on local health and other services and lead to community integration and conflict issues. In order to realistically gauge whether or not this will be a problem, a review should be carried out during the planning process to determine the need for additional health service capacity and community assistance in the area.
8. Health and safety issues: The work associated with the construction and operation of a nuclear power plant at the site brings with it the possibility of health and safety incidents. However, nuclear power stations are highly regulated in this regard and must not only comply with the requirements of the Health and Safety at Work Act 1974 but also with the requirements of the Nuclear Installations Act 1965 and the Ionising Radiations Regulations 1999. This means that the potential operator must have a licence from the Nuclear Installations Inspectorate (NII) before construction can begin. Such a licence will only be granted if the NII is satisfied that the power station can be built, operated and decommissioned safely with risks being kept to 'as low as reasonably practicable' (ALARP) at all times. The licence will, therefore, have conditions attached to it which will allow NII to control safety risks throughout the lifetime of the project.
9. Perception of risk: It is possible that the perception of risk associated with living or working near to a nuclear power plant could adversely affect the health and well-being of relevant individuals. However, there is little literature available on this potential impact which suggests that it has not been a significant problem in the past. In any event, in the case of the site, people living and working nearby have had a long time to get used to there being an adjacent nuclear plant so this is unlikely to be a problem at this location.
10. Recreation: With regard to recreation, there is a potential impact associated with the coastal path which passes the site. It is likely that this path may need to be closed during some phases of power station construction but this effect will be temporary and can readily be mitigated by providing a bypass path around the site.
11. Community well-being: The Copeland Borough Council area is a deprived area with barriers to housing and services being a particular problem. The siting of a new nuclear power station at the site should help to alleviate this deprivation somewhat as more jobs will be created in the area leading to an increase in community wealth, additional housing and other associated neighbourhood infrastructure.
1. Community disturbance: Community disturbance: The presence of, and more particularly the construction of, a nuclear power station at the nominated site is certain to increase community disturbance to some degree when compared to the current situation. Potential disturbances in the construction phase include noise and vibration, dust and increased traffic although these effects would be temporary. Construction noise will be variable and

Human Health and Well-being

transient in nature and will need to be mitigated by the use of good construction practice, regulation and timing of construction operations, the use of noise controlled plant and equipment and noise and vibration monitoring. There is also likely to be some disturbance associated with increased traffic during the operational and decommissioning phases of the power station. These effects should be considered, and mitigated if necessary, during the planning stage of the power station project by considering the adoption of an environmental management plan for the construction phase and an appropriate transport plan for all project phases. In particular, significant benefits would result if potential sources of noise emissions could be reduced through a combination of engineering design solutions.

12. **Employment:** Whilst employment levels in the Copeland Borough Council area are reasonable when compared to the rest of England, there are still people seeking work in this area and the region in general. As has been demonstrated, being in work can contribute to individual healthiness and, more particularly, being unemployed can be harmful to health in both a mental and physical sense. The development of a new nuclear power station at the site can thus be expected to improve the general mental and physical health and well-being of the area's population by providing more short term (construction and decommissioning phases) and long term (operational phase) work opportunities.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	+	+	+
Likelihood	M	M	M

Significant Effects

- The rigorous system of regulating routine radioactive discharges from the potential nuclear power station at Braystones should ensure that there are no unacceptable risks to health when the plant is operating normally
- The potential requirement for appropriate additional health service capacity for the influx of both construction and operational workers.
- The construction and operation of the proposed nuclear power station may lead to unacceptable community disturbance.
- It is likely that the presence of a new nuclear power station at the site will lead to an increase in employment, community wealth, additional housing and other associated neighbourhood infrastructure – these positive effects are likely to be much more significant than any potential

Mitigation and Monitoring Possibilities

- Ensure potential cumulative effects are calculated and assessed when planning and consenting all future nuclear power plants.
- Carry out a review of local health provision to ensure it is adequate for the expected influx of power station workers.
- Ensure an environmental construction management plan and an all-phase travel plan are produced, observed and monitored.
- Ensure sufficient monitoring of power station discharges and effects on local health is

Human Health and Well-being	
negative consequences assuming any effects on population health are not realised.	undertaken throughout the operational and decommissioning phases of the project.

Cultural Heritage

AoS Objective:

- 22. To avoid adverse impacts on the internationally and nationally important features of the historic environment.
- 23. To avoid adverse impacts on the setting and quality of built heritage, archaeology and historic landscapes

Guide questions:

- Will it adversely affect historic sites of international/national importance and their setting?
- Will it adversely affect other historic sites of known value?
- Will it adversely affect landscapes of historic importance?

Potential Receptors:

- Scheduled Monuments
- Listed Buildings
- Conservation Areas
- Historic Landscape
- Archaeology

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The nearest scheduled monument consists of two high cross shafts in St. Bridget’s Churchyard which lies approximately 750m from the site. A potential effect on its setting may arise from the development of a new nuclear power station, as for other scheduled monuments in the wider vicinity. A further four SAMs lie within 2.5km and 5km of the site.
2. The closest listed building is Braystones Tower (also called Diamond Jubilee Tower), a Grade II Listed Building, located approx 500m from the site. The closest Grade I Listed Building is Egremont Castle, located over 3km to the north of the site. Further Grade II listed buildings are present within approximate 5km distance of the site. A potential effect on the settings of these listed buildings may arise from the development.
3. Adverse effects on the settings of the monuments and listed buildings closest to the site could be minimised by including appropriate landscaping / planting schemes to reduce setting effects.

Cultural Heritage

Regional/ Local

4. Conservation Areas exist at Beckermeth and Egremont and there is a potential setting effect.
5. Operational effects include potential setting effects on historic assets in the wider vicinity.
6. Some of the fields within the site are shown on a 19th century Ordnance Survey map and there is potential for historic landscape to exist.
7. Prehistoric or Roman flints have been found within the site. The presence of these features indicates prehistoric activity within and close to the site. As such the area is likely to be considered of at least local importance to regional archaeological.
8. If a buried archaeological resource exists significant effects to this resource are possible during decommissioning as excavations are likely to be required.
9. Adverse effects on the settings of the Conservation Areas and listed buildings closest to the site could be minimised. Mitigation possibilities also include appropriate landscaping / planting schemes to reduce adverse setting effects. It is likely that a detailed archaeological investigation of the area will be required, including intrusive investigation (for example trial trenching and detailed recording).

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-	-	-
Likelihood	M	M	M

Significant Effects

- If a buried archaeological resource is present the main effects would be at a local scale, within the footprint of the proposed new facility. Effects would be permanent and irreversible.
- Immediately surrounding the site, there may be potential effects on the settings of historic assets. The significance will depend on distance, topography and the ability to mitigate.

Mitigation and Monitoring Possibilities

- Detailed investigations (trial trenching etc.) may be required prior to construction, with an excavation and/or watching brief potentially required prior to and during the construction phase.
- It may be possible to mitigate against potential adverse setting effects on heritage assets through appropriate landscaping/planting schemes.

Landscape
<p>AoS Objective:</p> <p>24. To avoid adverse impacts on Nationally important landscapes. 25. To avoid adverse impacts on landscape character, quality and tranquillity, diversity and distinctiveness.</p> <p>Guide questions:</p> <p>Will it adversely affect landscapes within or immediately adjacent to a National Park? Will it adversely affect landscapes in or immediately adjacent to an AONB? Will it adversely affect Heritage Coast or Preferred Conservation Zones? Will it adversely affect local landscapes/townscapes of value? Will it affect the levels of tranquillity in an area? Will it adversely affect the landscape character or distinctiveness?</p>
<p>Potential Receptors:</p>
<ul style="list-style-type: none"> • The landscape character and visual amenity of visitors to and residents of the nearby Lake District National Park will be affected, at a distance of 3.5km. • The landscape character, landscape value/visual amenity and perception of tranquillity of visitors to the area and residents within National Character Area 7 and the adjacent National Character Area 8 will be affected. • The landscape character, landscape value/visual amenity and perception of tranquillity of visitors to and residents of the St Bees Head Heritage Coast may be affected. • The landscape character, landscape value/visual amenity and perception of tranquillity of some conservation areas, residents and visitors to the Landscape of County Importance may be affected.
<p>Potential Significant Effects and Mitigation Possibilities:</p>
<p>International/ National/ Transboundary</p> <ol style="list-style-type: none"> 1. Views from the Isle of Man (55km west of the site) towards the site are possible on clear days and likely to be significant. 2. The Lake District National Park lies approximately 3.5km to the east of the site and significant views of the site are possible from many locations within the National Park. The existing nuclear facilities at nearby Sellafield have been visible in the landscape over a long period of time from these views however; a new power station and associated infrastructure (for example grid connections) will potentially lead to significant further deterioration in

Cultural Heritage

views on what is a nationally important landscape. Opportunities for mitigation are likely to be limited during the construction and operational phases given the potential scale of new buildings and the extent of associated construction areas.

3. The St Bees Head Heritage Coast is located approx 5km to the north of the site. Although not directly affected, views of the site are likely from this designated coast and are likely to be significant.

Regional/ Local

4. The site is located within National Character Area (NCA) 7: West Cumbria Coastal Plain. This assessment identifies the adjoining area as follows : *'Strong industrial history associated formerly with the mining of coal and iron ore and, more recently, the chemical industry, power generation and nuclear reprocessing; Extensive urban fringe areas within the coastal belt with large highly visible factories and manufacturing and processing plants, particularly near Workington, Whitehaven, Sellafield and Barrow'*. Note: The land within and immediately around the site is not of industrial character and is largely open in character. Sellafield, to the south, is the nearest industrial area.
5. The site is located in a locally designated landscape; is within Landscape Character recognised to be of County Importance. The site is within the landscape character type known as Coastal Sandstone as described in the Cumbria and Lake District Joint Structure Plan 2001 - 2016: Technical Paper 5: Landscape Character, 2003.
6. There will be a loss of local landscape features including woodland pockets, roadside tree belts, farmsteads and farmland - arable and pasture with managed hedgerows, effects on a route that forms part of the National Cycle Network (National Route 72), loss of the buildings and associated car park and buffer planting. The site lies to the east of the railway line and thus beyond the immediate shoreline so there will be limited effects on the intertidal flats, coastal marsh and beach areas.
7. Given the likely scale of any new development and the open nature of the landscape surrounding the site, it will not be possible to mitigate for all the indirect landscape and visual impacts over a long timescale, either immediately surrounding the site or from surrounding areas of higher ground, from which the site is visible. In addition, development in close proximity to the existing facility at Sellafield will add to the landscape and visual impacts of this existing facility, which is already a prominent feature along the coast. The cumulative impacts of the development of this site, combined with existing nuclear power stations and potential offshore and onshore wind farms are likely to be significant.
8. Construction of a marine landing platform or water cooling culverts would potentially have direct adverse landscape and visual impacts, resulting from changes to the intertidal zone and coastal landscape. Direct adverse landscape and visual impacts would also result from the creation of construction compound areas, new power station buildings, new pylons, ancillary facilities and a new sea defence wall, if required. The visual effects of construction and the operational scheme on residents and visitors in the surrounding areas including effects associated with lighting and traffic may also be significant.

Cultural Heritage

9. Mitigation potential includes the following measures:

- Protection measures allowing for the conservation of existing vegetation particularly existing screening tree belts in the overall development including in the temporary construction laydown area and avoidance of temporary laydown areas on the foreshore, where views are prominent.
- Sensitive design and/or alignment of the water cooling facility and a low impact design for the marine landing platform to avoid adverse impact on the coastline. Provision of buffer zones between construction areas and the residential areas surrounding the site; delivery of construction materials by sea to reduce road use and the use of strict directional, cut off low level lighting and restricted working hours to limit light pollution.

10. Key positive mitigation opportunities could include landscape restoration and off site enhancement measures, including creation of replacement tree belts, cycle paths, grazing land and hedgerow restoration to the decommissioned site, the temporary construction areas and the surrounding landscape. Also there is an opportunity to ensure long term delivery of landscape and habitat enhancement through the development of an integrated land management plan for the site.

11. With the potential site design and mitigation in place, it is unlikely that all impacts could be fully mitigated directly on the site until after decommissioning, however, there remains some uncertainty at this stage over the future land uses given the timescales involved.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	--	--	0?
Likelihood	M	M	M

Significant Effects

- During construction and operation the main direct landscape impacts would be within an area of recognised County Landscape importance and over time some of these could be compensated for. However, it is highly likely that there will be some long lasting county and national level adverse landscape and visual impacts including effects on the nearby Lake District National Park and St Bees Head Heritage Coast and their settings, with limited potential for mitigation. These will arise from both large scale development on a greenfield site and the potential off-site grid connections to the east. The existing nuclear facility at Sellafield, a short distance to the south, is already a prominent built feature from viewpoints within the National Park and Heritage Coast and also from long-distance viewpoints, including

Mitigation and Monitoring Possibilities

- Given the scale of the likely development, the open and Greenfield nature of the site and the elevated land of the Lake District National park to the east, effective mitigation of adverse effects on the nationally designated landscape during the construction and operational phases is unlikely.
- There is some potential for landscape /

Cultural Heritage

the Isle of Man. Further development is highly likely to lead to a perceptible deterioration in some views, which would not be able to be mitigated, given the scale of new buildings.

- The decommissioning of the facilities may allow some landscape restoration of previously developed areas in the long term, however, the long term land uses for restored areas are difficult to predict. This leads to the view that the precautionary principle ought to be applied when it comes to assessing the significance of impacts at this stage.

ecological mitigation / restoration on the site to mitigate some local impacts. These could include: conservation and extension of existing tree belts and hedgerow restoration/restored grazing land. These can be delivered and monitored through an integrated land management plan. However, detailed mitigation measures will need to be developed at EIA stage.

Soils, Geology and Land use

AoS Objective:

- 19. To avoid damage to geological resources
- 20. To avoid the use of greenfield land and encourage the re-use of brownfield sites
- 21. To avoid the contamination of soils and adverse impacts on soil functions

Guide questions:

- Will it result in the compaction and erosion of soils?
- Will it lead to the removal or alteration of soil structure and function?
- Will it lead to the contamination of soils which would affect biodiversity and human health?
- Will it compromise the future extraction/ use of geological/ mineral reserves?
- Will it result in the loss of agricultural land?
- Will it lead to damage to geological SSSIs and other geological sites?
- Will it result in the loss of Greenfield land?
- Will it adversely affect land under land management agreements?

Potential Receptors:

- The site lies within an area of mixed agricultural land and urban land use. No significant geological designated site lies within the local vicinity.
- Some land management areas are designated within the local vicinity including some floodplain grazing and country side steward schemes.
- Adjacent agricultural land/green field land (to be confirmed by nomination) adjacent to the site

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. There are no geological designations of note within the local vicinity.
2. The loss of greenfield land is not considered as being significant on a national level.

Soils, Geology and Land use

Regional/ Local

3. The soils in the local area adjacent to the site lie within a region classified to be of low fertility by the National Soils Resources Institute. Any development is likely to have a local effect on agricultural land use and agriculture is prevalent in the local area. The soils could potentially be returned to an equivalent agricultural grade but reinstating the original soils matrix is unlikely. The extent of the loss of agricultural land is unlikely to be significant in a national context. Soils could be returned to a similar agricultural importance once the site has been decommissioned however the original soils matrix is unlikely to be restored.
4. Construction of new plant upon greenfield sites. The loss of greenfield land is likely to be of local significance.
5. Radioactive contamination of soils is not covered as part of this assessment but is covered by the additional research being undertaken as part of the wider radioactive waste issue. The site would fall within National Permitting requirements and therefore management of the site in order to prevent the contamination of soils would be covered by these legislative requirements. Contamination and effects to Human Health would also be covered by this investigation.
6. Landfills have been identified to the south of the site, around the existing nuclear facility at Sellafield. This is likely to be of minor significance as any disturbance/assessment would need to be addressed with the relevant regulator. Detailed assessments of existing contaminated land will need to be undertaken as part of the site specific EIA.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-	-?	-
Likelihood	M	M	M

Significant Effects

- There are no significant effects identified around the site.

Mitigation and Monitoring Possibilities

- n/a

Water: Hydrology and Geomorphology

AoS Objective:

15. To avoid adverse impacts on surface water hydrology and channel geomorphology (including coastal geomorphology).

Guide questions:

Will it result in the increased sedimentation of watercourses?

Will it adversely affect channel geomorphology?

Will hydrology and flow regimes be adversely affected by water abstraction?

Will it result in demand for higher defence standards that will impact on coastal processes?

Can the higher defence standards be achieved without compromising habitat quality and sediment transport?

Potential Receptors:

- Local and district resident population and tourists.
- Local and district ecosystems in coastal, fluvial and estuarial waters and on the foreshore.

Potential Significant Effects and Mitigation Possibilities:

International/National/Transboundary

1. The potential effects on surface water hydrology and fluvial and coastal geomorphology are likely to be limited to the Cumbria Coast and the coastline within approximately 10-20km of the site. It will be necessary, however, to undertake a data collection and modelling exercise to confirm the spatial extent of this impact.

Regional/Local

2. The site is currently not at risk from coastal flooding, according to the Environment Agency (EA) maps⁵. However, during the life span of site, and as a result of potential climate change and related sea-level rises, this will need to be confirmed by a more detailed assessment at the sites of interest. If this leads to the requirement for the construction of additional or upgraded coastal defences, these defences would be need to be designed to

⁵ http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=303500.0&y=501500.0&topic=floodmap&ep=map&scale=1&location=Seascale,%20Cumbria&lang=_e&layerGroups=default&txonly=off

Water: Hydrology and Geomorphology

counteract the effects of existing coastal processes such as coastal retreat, but are likely to have the secondary effect of impacting the tidal-driven movement of sediment along the coastline. These may have further effects on marine ecosystems. The effects are likely to continue as long as the coastal defences need to be maintained to protect the site. It is not possible to assess whether these effects will be positive or negative without further information on the proposed design of the defences, and a more detailed investigation of the local and regional coastal physical processes/dynamics. The effects of the construction and long-term presence of upgraded coastal defences on coastal process, hydrodynamics and sediment transport along the coastline could be reduced or possibly eliminated by the adoption of suitable, environmentally-friendly designs.

3. The provision of cooling water for the proposed power station is likely to be from coastal waters. Previous work on this issue from the mid 1990s was summarised in 2006 looking at potential impacts of New Build in Cumbria⁶. This review indicated that there were likely to be restrictions on fresh water supplies to provide cooling waters, and therefore sea water was the preferred option. This review also highlighted that the cooling water intakes and outfalls were proposed to be constructed by tunnelling to avoid disturbing radioactive materials on the seabed. In more general terms, construction disturbance associated with these works may have the short-term effect of accelerated delivery of sediment to water bodies during construction. Over the longer-term, during operation, there is the possibility that the discharge of cooling water may affect local coastal, hydrodynamics and sedimentation processes. The effects of construction and operation of the cooling water system on coastal processes, hydrodynamics and sediment transport along the coast could be reduced or potentially eliminated by suitable design and construction methods.
4. The potential effects of the development on the local river network includes the modification of the local drainage network through local diversion of small watercourses and drainage ditches, the removal of riparian vegetation and associated bank collapse, and increased loading of channel banks from construction machinery. During construction there is also a risk of increased sediment transfer to water courses from excavated areas and stockpiles. In addition, there is the risk of increased transfer of sediment from site drainage and from dredging activities to water bodies. The development is also likely to affect surface water run-off through increasing the surface of impermeable areas (for example roads and car parking areas). These potential adverse effects may, however, be reduced by suitable mitigation methods, for example, Sustainable Drainage Systems (SuDs), including the use of permeable pavements, and retention ponds or swales to retain drainage water and sediments.

⁶ Potential New Build in Cumbria (2006) Report prepared for Cumbria Partners by ERM and IDM, March 2006

Water: Hydrology and Geomorphology						
Summary of Significant Strategic Effects:			Timescale	C	O	D
			Significance	-	-	-
			Likelihood	M	M	M
<p>Significant Effects</p> <ul style="list-style-type: none"> • Possible additional coastal defence works on coastal processes and sediment transport, and any indirect effects on internationally designated habitats. • Works to provide (and discharge) cooling water on coastal processes, and sediment transport, and any indirect effects on internationally designated habitats. Disturbance of existing radioactive sediments. 	<p>Mitigation and Monitoring Possibilities</p> <ul style="list-style-type: none"> • Suitable design, including use of SuDs. • Selection of appropriate construction methods. 					

Water: Water Quality (including surface, coastal and marine)	
AoS objective:	16. To avoid adverse impacts on water quality (including surface, coastal and marine water quality) and to help meet the objectives of the Water Framework Directive.
Guide questions:	<p>Will it cause deterioration in surface water quality as a result of accidental pollution, for example spillages, leaks?</p> <p>Will it cause deterioration in coastal and / or marine water quality as a result of accidental pollution, for example spillages, leaks?</p> <p>Will it cause deterioration in surface water quality as a result of the disturbance of contaminated soil?</p> <p>Will it cause deterioration in coastal and / or marine water as a result of the disturbance of contaminated soil?</p> <p>Will it affect designated Shellfish Waters?</p> <p>Will it affect Freshwater Fisheries Directive sites?</p> <p>Will it increase turbidity in water bodies?</p> <p>Will it increase the temperature of the water in water bodies?</p>
Potential Receptors:	
	<ul style="list-style-type: none"> • Local and district resident population and tourists. • Local and district ecosystems in coastal, fluvial and estuarial waters and on the foreshore. • Regional and international receptors could potentially be affected by releases of persistent contaminants.
Potential Significant Effects and Mitigation Possibilities:	
International/ National/ Transboundary	Not significant.
Regional/Local	<p>1. The main liquid discharges from the proposed power station during routine operation will be treated effluent from the wastewater treatment plant and the return of cooling water to the estuary at elevated temperatures (if this mode of cooling were to be selected). The Environment Agency will be responsible for consenting the discharges and it is anticipated that they will seek to apply standards that ensure that the discharges lead to no deterioration in water quality or meet the statutory water quality standards, whichever is the most stringent.</p>

Water: Water Quality (including surface, coastal and marine)

2. In the case of the discharge of cooling water it is unlikely to be feasible to eliminate some changes in thermal conditions locally. Detailed appraisal of the proposals for disposal of cooling water will be required to assess the acceptability of this effect. Earlier studies associated with the nearby Sellafield site have recently been reviewed and have indicated that to achieve the required thermal and chemical dispersion, a single station outfall would need to extend 2.5km offshore. If a second station were contemplated, a 4km separation would be required between the two outfalls. The intakes would be 1.8km offshore in both cases. In terms of impacts on ecology, predicted effects were based upon modelling and experience from other power stations and indicated that neither thermal effluent nor biocide would exert significant impacts on the ecology of receiving waters. The review highlighted some potential impacts on migrating salmon and sea trout by baseline data on the behaviour of these species off-shore was not available.
3. Liquid waste streams are separated from the radioactive materials; accordingly radioactive materials are not expected to be present in any of the routine discharges of liquid waste. It is expected that liquid discharges will be treated to standards set by the Environment Agency to ensure compliance with all relevant legislation.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-	-	?
Likelihood	M	M	M

Significant Effects

- Thermal impact of cooling water discharges (if this mode of cooling were to be adopted). However, this effect is limited to local and regional significance.

Mitigation and Monitoring Possibilities

- Thermal discharges will need to be consented by the Environment Agency. The discharge quality will need to comply with existing standards or meet the no deterioration standard.

Water: Water supply and demand	
AoS objective:	
	17. To avoid adverse impacts on the supply of water resources.
Guide questions:	
	Will it adversely affect water supply as a result of abstraction? Will it increase demand for water?
Potential Receptors:	
	<ul style="list-style-type: none"> • Local and district resident population and tourists. • District ecosystems dependent on surface water features.
Potential Significant Effects and Mitigation Possibilities:	
International/ National/ Transboundary	
	Not significant.
Regional/ Local	
	<ol style="list-style-type: none"> 1. The site lies within the River Ehen catchment. Surface and groundwater in the vicinity of the site is not currently used for water supply. However, both the River Calder and River Ehen Water Resource Management Units (WRMUs) are classified as over-abstracted, while the River Irt WRMU, which includes Wast Water from which the nearby existing nuclear facility at Sellafield draws its water supply, is classified as having “no water available”. If groundwater abstraction is proposed, there is a risk of saline intrusion into the aquifer. This may also impact on existing abstractions. Further assessment of impacts on surface and groundwater is required, including the assessment of alternative options. 2. The construction and operation of the proposed new nuclear power station may, however, increase demand for potable supplies both at the site and in local communities where the workforce will live. Depending on the nature of the demand and the potential efficiency savings, there may be implications for meeting this demand, especially as the WRZ in which the site(s) are located is projected to be in deficit without implementation of measures to address this (see below). However, this is unlikely to be significant in the operational phase where the numbers of additional workers is small; it may be more significant during the construction period when a substantial increase in the local population is likely. Nevertheless the issue of water resources availability over the lifetime of the site needs to be assessed.

Water: Water supply and demand						
<p>3. The West Cumbria WRZ has a projected deficit to 2035. Measures to address this deficit include leakage reduction and by 2014/15 bringing into supply a new groundwater source at South Egremont. Thus, there is the potential to provide water supply to the site without a negative impact on the WRZ supply-demand balance. This would need to be confirmed once estimates of predicted water use are available and can be included with the supply-demand balance calculations.</p> <p>4. Cooling water may be sourced from the Irish Sea. As such, the inlet and outlet pipes may have impacts on biodiversity in relation to altering coastal processes and accelerated erosion.</p> <p>5. Impacts of water supply and demand on biodiversity need to be considered.</p>						
Summary of Significant Strategic Effects:			Timescale	C	O	D
			Significance	-?	-?	-?
			Likelihood	M	H	H
<p>Significant Effects</p> <ul style="list-style-type: none"> Increased demand for water during the lifetime of the site. The potential magnitude and duration of increased water demand will depend on the timing of the new site development in relation to the activities (operation or decommissioning) at the nearby Sellafield Site, through to operation and decommissioning. Similar significant effects are likely to apply to wastewater production from the site. 			<p>Mitigation and Monitoring Possibilities</p> <ul style="list-style-type: none"> Studies to ensure that capacity of water and wastewater infrastructure in WRZ is sufficient. 			

Water: Groundwater Quality and Flow																
<p>AoS Objective: 18. To avoid adverse impacts on groundwater quality, distribution and flow and to help meet the objectives of the Water Framework Directive</p> <p>Guide questions: Will it cause deterioration in groundwater quality as a result of accidental pollution, for example spillages, leaks? Will it cause deterioration in groundwater quality as a result of the disturbance of contaminated soil?</p>																
Potential Receptors:																
<ul style="list-style-type: none"> Local and district resident population and tourists. Local and district ecosystems with connections to groundwater. 																
Potential Significant Effects and Mitigation Possibilities:																
<p>International/ National/ Transboundary Not significant.</p>																
<p>Regional/ Local</p> <ol style="list-style-type: none"> The site is located on both a Minor and Major aquifer. However, there are no groundwater protection zones in close vicinity of the site. There is no known use made of these water resources in the vicinity of the sites but springs on the beach are fed by groundwater and groundwater may also flow into the lower reaches of the rivers. There may be some disruption of local groundwater flows during construction, but in the long term impacts are expected to be minimal. 																
Summary of Significant Strategic Effects:				<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">Timescale</td> <td style="text-align: center;">C</td> <td style="text-align: center;">O</td> <td style="text-align: center;">D</td> </tr> <tr> <td style="text-align: center;">Significance</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> </tr> <tr> <td style="text-align: center;">Likelihood</td> <td style="text-align: center;">M</td> <td style="text-align: center;">M</td> <td style="text-align: center;">M</td> </tr> </table>	Timescale	C	O	D	Significance	0	0	0	Likelihood	M	M	M
Timescale	C	O	D													
Significance	0	0	0													
Likelihood	M	M	M													
<p>Significant Effects</p> <ul style="list-style-type: none"> Potential impacts on groundwater dependent features and aquatic ecosystems in proximity to the site. 		<p>Mitigation and Monitoring Possibilities</p> <ul style="list-style-type: none"> Studies to ensure that groundwater dependent bodies are investigated and that suitable monitoring and design is adopted to mitigate potential impacts. 														

Flood Risk	
AoS Objective:	14. To avoid increased flood risk (including coastal flood risk) and seek to reduce risks where possible
Guide questions:	Will it result in demand for higher defence standards?
Potential Receptors:	
	<ul style="list-style-type: none"> • Site workers. • Local and District ecosystems in estuarine waters.
Potential Significant Effects and Mitigation Possibilities:	
International/ National/ Transboundary	Not significant.
Regional/ Local	<ol style="list-style-type: none"> 1. The site is located mostly in Flood Zone 1, but is bounded along the coastline by Flood Zone 3. 2. It is likely through the impacts of climate change on sea level rise that flood risk to the site will increase. Further investigation is required to assess the impacts of coastal processes, hydrodynamic and sediment transport on the site, as a result of sea level changes. 3. The site is shown to be defended, but at this time no information was available regarding the composition, condition grade and standard of protection afforded by these defences. 4. To mitigate against flood risk for the lifetime of the development ongoing maintenance and improvement of these defences may be required, which may affect coastal processes. Maintenance of the defences of the railway line likely to be required and is strategic to the site. 5. To mitigate against these effects any improvement in existing or construction of new defences will require appropriate design, construction and management. 6. Local land raising at the site could also mitigate against increased flood risk.

Flood Risk						
Summary of Significant Strategic Effects:			Timescale	C	O	D
			Significance	-	-	-
			Likelihood	M	M	M
<p>Significant Effects</p> <ul style="list-style-type: none"> Main effects are through the continued management and improvement of existing defences which may affect coastal processes. 			<p>Mitigation and Monitoring Possibilities</p> <ul style="list-style-type: none"> Further investigation is required to assess the impacts of coastal processes, hydrodynamic and sediment transport on the site, as a result of sea level changes. It may be possible to mitigate these effects appropriate management and techniques for improving the existing defences. 			

Appendix 3: Plans and Programmes Review (Regional)

Regional Spatial Strategy for the North West 2008-2021 (North West Regional Development Agency), revoked July 2010⁷

The Regional Spatial Strategy (RSS) for the North West replaces all of the structure plan policies of the Joint Lancashire Structure Plan (2005). It outlines sub-regional policy and guidance for sustainable development in housing, jobs, transport, climate change and environmental sectors.

Economic:

- The Regional Economic Strategy (RES) for the North West identified that the Gross Value Added (GVA) for the North West is 12% lower than the England average.
- The RSS sets out to promote the shift to modern industries to support an economic revival.

Natural Environment:

- The North West contains 438 SSSI's however less than half of these are considered to be in favourable condition.
- The habitats and species of the North West will be protected in accordance with the North West Biodiversity Action Plan.

Renewable Energy:

- The region has higher than average emissions of greenhouse gases and produces only 6% of its energy from renewable means.
- In line with the North West Sustainable Energy Strategy the RSS aims to double its installed Combined Heat and Power (CHP) capacity by 2010 from 866 MWe to 1.5 GW.

Historic Environment:

- The historic environment of the North West will be protected and enhanced by supporting conservation led regeneration of historically important areas.

Coastal Planning and flood risk:

- Careful siting of infrastructure to avoid future loss or excessive costs of coastal defences.

⁷ Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

- Sea levels predicted to rise between 12 and 67cm by 2050s.
- The majority of the region's coastal zone is low lying (below the 10m contour), comprised of soft sediments and therefore vulnerable to coastal erosion and flooding.
- Minimise the loss of coastal habitats and avoid damage to coastal processes.

Water Resources:

- Integrated water management for the protection of ground, surface and coastal waters utilising plans and strategies such as the River Basin Management Plan.

Waste Management:

- Plans and strategies for waste management which reflect those set out in the Waste Strategy for England 2007.
- growth in municipal waste to be reduced to zero by 2014;
- 40% of household waste to be reused, recycled or composted by 2010; 45% by 2015; and 55% by 2020;

Mineral extraction:

- The region has important reserves of minerals in offshore, coastal and estuary locations, notably hydrocarbons but also marine sand and consumption of aggregates is the fourth highest in England.
- Working with the construction industry to achieve a target of 20% of construction aggregates to be from secondary or recycled sources by 2010 and 25% by 2021.

LINK: <http://www.gos.gov.uk/gonw/Planning/RegionalPlanning/>

Regional Economic Strategy for North West England 2006-2026 (North West Regional Development Agency), revoked July 2010⁸

The Vision of the RES is for “*A dynamic, sustainable international economy which competes on the basis of knowledge, advanced technology and an excellent quality of life for all*”.

⁸ Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

The RES identifies three major drivers to achieve the vision;

- Improve productivity and grow the market
- Grow the size and capability of the workforce
- Create and maintain the conditions for sustainable growth

LINK: <http://download.southwestrda.org.uk/file.asp?File=/res/general/RES2006-2015.pdf>

North West Climate Change Action Plan 2007-2009 (North West Climate Change Partnership), revoked July 2010⁹

The action plan has been developed with regional authorities and will be delivered by the North West Climate Change Partnership.

The relevant priority objectives are;

- Ensure that all regional plans and policies have sustainable energy and climate change impacts at their core.
- Develop regional targets for increasing renewable energy generation and decreasing greenhouse gas emissions.
- Deliver clear business support and advice resource and energy efficiency, sustainable transport planning and climate change risks and opportunities.
- Promote best practise in personal and workplace travel planning.
- Assess future regional risks and priorities for energy generation technologies to meet future forecast energy demands.
- Encourage installations of micro generation and energy efficient technologies for commercial property owners and householders.
- Increase the availability of funding for research, commercialisation and development for low carbon technologies and fuels.
- Identify and support the largest public, private and domestic sector greenhouse gas emitters in the region to identify and implement the best opportunities to reduce their contribution.

LINK: <http://www.nwda.co.uk/PDF/climatechange.pdf>

⁹ Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and polices set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

Cumbria Biodiversity Action plan (2001) (Cumbria Biodiversity Partnership)

The Cumbria Biodiversity Action Plan identifies 39 species and habitat plans covering over 700 individual actions designed to conserve and/or enhance a range of threatened species or habitats of both local and national importance. 100,000 jobs are related to the environment in the North West of England which accounts for 2.1% (£3 billion) of the regions GDP.

The action plan targets are;

- To maintain all areas of moor land, moss land, sand dunes, woodland and estuarine river and salt marsh habitats
- To maintain and expand reed bed, grassland and heath land areas by 2015.
- To allow the full re-establishment of salt marshes to compensate for past loss and to mitigate against sea level rise.

LINK: <http://www.wildlifeincumbria.org.uk/>

Cell 11d (Walney Island to St. Bees Head) Shoreline Management Plan (2000) (Copeland Borough Council)

The Shoreline Management Plan (SMP) enables local authorities to identify long term, sustainable policies for coastal defence.

The two main areas the plan addresses are;

- Sediment movement and coastline change - this area of coastline is always changing and natural defences of shingle, sand and salt march are very important for coastal protection.
- Coastal defences – the land along this coastline is in places lower than the highest recorded tide therefore, this area is dependant on natural or man made flood defence.

The SMP identifies the areas which are at risk and describes existing flood defences which need to be maintain or upgraded. The SMP for Sellafield is to “Hold the line” meaning that existing defences need to be maintained, improved or rebuilt.

LINK: <http://www.defra.gov.uk/enviro/fcd/guidance/smpguid/vol2appe.pdf>

Sustainable communities in the North West (Office of the Deputy Prime Minister), revoked July 2010¹⁰

The report describes the actions and strategies for sustainable communities until 2020 with emphasis on 5 main areas;

- Housing – making it more affordable and create a better balance between supply and demand.
- Better living/working environment – focusing on health, safety, crime, poverty and water quality.
- Improving economic prosperity – as outlined in the RES for the North West.
- Safeguarding the countryside – focusing on rural recovery.
- Planning – avoiding further development on “green belt” areas.

LINK: <http://www.communities.gov.uk/documents/communities/pdf/143606.pdf>

Regional Waste Strategy for the North West 2004 (North West Regional Assembly)

This strategy will contribute to the sustainable development of the North West by encouraging waste management practices that will reduce waste generation, lessen the environmental impacts of waste production and improve resource efficiency.

The strategy sets out 19 targets and actions for the North West to work towards achieving, some of which include:

- Reducing growth in municipal waste across the North West to 2% by end of 2006, with a further reduction in growth to 1% before 2010 and 0% by 2014 across the region
- Recycle and/or compost 55% of household waste by 2020
- Recycle 35% of all commercial and industrial wastes by 2020
- Recover value from at least 70% of all commercial and industrial wastes by 2020
- Promote the use of recycled construction and demolition waste in construction projects and encourage developers and contractors to specify these materials wherever possible in the construction process

LINK: http://www.nwrpb.org.uk/?page_id=129

River Basin Management Plan for the North West 2009 (Environment Agency)

This plan outlines what the Environment Agency, under the guidelines of the UK Water Framework Directive, aim to achieve with regards to improving the water environment over the next 20 years. The plan focuses on the pressures facing the water environment in the North West River Basin District, and the actions that will address them.

¹⁰ Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

The key targets of the plan are:

- By 2015, 17% of surface waters (rivers, lakes, estuaries) in this river basin district are going to improve for at least one biological, chemical or physical element. This includes an improvement of over 1860km of river, in relation to fish, phosphate, specific pollutants and other elements
- 34% of surface waters will be at good or better ecological status/potential and 65% of groundwater bodies will be at good status by 2015
- At least 38% of assessed surface waters will be at good or better biological status by 2015

The following challenges are addressed in the plan:

- diffuse pollution from agriculture and other rural activities
- point source pollution from water industry sewage works
- physical modification of water bodies
- diffuse pollution from urban sources

LINK: <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/northwest/Intro.aspx>

Appendix 4: Baseline Information

Note: Information on Comparators and Trends is included where applicable/available.

Air

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Air				
Air Quality	1,2,3	<p>Air quality in the North West is generally good. Emissions to air from major industrial sites have reduced substantially, however emissions from traffic sources (major route corridors and areas of congestion) are continuing to cause pressures on local air quality across the region.</p> <p>In 2006, only 4% of air pollution incidents were classed as major or significant (Category 1 and 2).</p> <p>The prevailing wind direction for the region is south to south-south west.</p> <p>There are 47 Air Quality Management Areas (AQMAs) declared in the North West region of England, the majority of which serve to control emissions of nitrogen dioxide and particulate matter from traffic. No AQMAs have been declared within the Copeland Borough Council area.</p>		<p>The average number of days with moderate or higher air pollution in 2006 rose from 2005 levels, and was slightly higher than the average for urban sites in England, but lower than the England rural average. The increase in 2006 (as with an increase in 2003) correlates with hot, sunny weather experienced during these years, causing the production of elevated levels of ozone.</p> <p>Traffic in the region increased by 15% between 1995 and 2005, leading to air quality problems from major route corridors, and particularly congestion areas and at peak travelling times. Continuance of this trend will add further pressures on meeting air quality objectives. Both minor and serious pollution incidents reported to air increased from 2005 to 2006. Category 3 incidents increased from 436 in 2005 to 460 in 2006; Category 1 and 2 incidents from 17 to 19.</p>

Key to Data Sources


1	Environment Agency (2008). State of the Environment – North West . http://www.environment-agency.gov.uk/research/library/publications/34061.aspx [accessed 12 March 2009]
2	Defra. UK Air Quality Archive – Air Quality Management Areas. http://www.airquality.co.uk/archive/laqm/laqm.php [accessed 12 March 2009]
3	Met Office: Regional Climate – North West. http://www.metoffice.gov.uk/climate/uk/nw/ [accessed 12 March 2009]

Biodiversity and Ecosystems

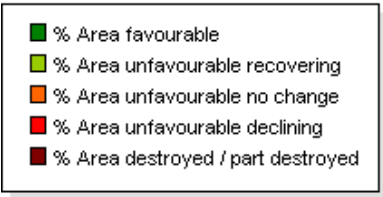
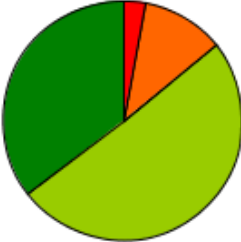
Indicator	Data Source	Current Data	Comparators	Trend
Topic: Biodiversity and Ecosystems				
North West Biodiversity Audit Protected Habitats	1	North West England is rich in wildlife and habitats with coasts, estuaries, uplands and wetlands of international importance. A total of 82 habitats of which 37 are UK key habitats have been identified in the North West Biodiversity Audit and 18% of land within the north west is protected through designations. Regional targets for important habitats are delivered through Local Biodiversity Action Plans. The Cumbria Biodiversity Action Plan is relevant to the site.		
North West Biodiversity Audit Protected Species	1	97 species of particular conservation importance are identified within the North West Biodiversity Audit including UK BAP priority species and those which are endemic to the region. Regional targets for important species are delivered at a more local level through Local Biodiversity Action Plans. The Cumbria Biodiversity Action Plan is most relevant to the site.		
Cumbria Biodiversity Action Plan	2,3	The Cumbria BAP was published in April 2001 and contains over 700 actions within 21 Species Action Plans, 18 Habitat Action Plans and four generic 'Action Plans for Common Themes'. The latter cover issues of public involvement, legislation and planning, land management and policy for the wider environment and data and information.		
Natura 2000 sites (N2K)	4	There are 6 N2K sites within 20 km of the site : <ul style="list-style-type: none"> • Borrowdale Woodland Complex SAC • West Water SAC • River Ehen SAC • Lake District High Fells SAC • River Derwent and Bassenthwaite Lake SAC • Drigg Coast SAC 		


Indicator	Data Source	Current Data	Comparators	Trend
		N2K Sites considered to be most relevant in relation to any development of the site are described in more detail below:		
Drigg Coast SAC	5	<p>The Drigg Coast qualifies as a SAC for the following primary and qualifying Annex 1 Habitats:</p> <ul style="list-style-type: none"> • Mudflats and sandflats not covered by seawater at low tide • <i>Salicornia</i> and other annuals colonising mud and sand • Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>) • Embryonic shifting dunes • Shifting dunes along the shoreline with <i>Ammophila arenaria</i> ('white dunes') • Fixed dunes with herbaceous vegetation ('grey dunes') * Priority feature • Humid dune slacks <p>Annex II species associated with the SAC include great crested newt <i>Tristurus cristatus</i>.</p>		
River Ehen SAC	6	<p>The River Ehen supports the largest freshwater pearl mussel <i>Margaritifera margaritifera</i> population in England. Exceptionally high densities (greater than 100 m²) are found at some locations, with population estimates for the entire river exceeding 100,000. The conservation importance of the site is further enhanced by the presence of juvenile pearl mussels, indicating recruitment since 1990.</p> <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Freshwater pearl mussel <i>Margaritifera margaritifera</i> <p>Annex II species present as a qualifying feature, but not a primary reason for site selection:</p> <ul style="list-style-type: none"> • Atlantic salmon <i>Salmo salar</i> 		
Wast Water SAC	4	<p>Wast Water is a relatively large and deep example of an oligotrophic waterbody (Type 3) and lies almost entirely on Borrowdale Volcanics rocks, and rocky substrates predominate along 73% of its shoreline.</p> <p>Annex I habitat that is a primary reason for selection of this site:</p> <ul style="list-style-type: none"> • Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea 		

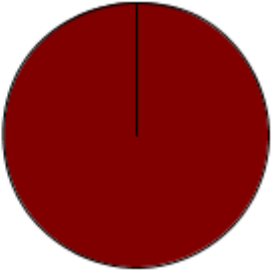
Indicator	Data Source	Current Data	Comparators	Trend												
River Derwent and Bassenthwaite Lake	4	<p>Bassenthwaite Lake is an example of a mesotrophic waterbody (Type 5), an unusual type in mountain areas. It is a large lake with an extensive catchment area and consequently is subject to rapid through-flow of water and moderate nutrient status.</p> <p>Annex I habitats that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or of the Isoëto-Nanojuncetea <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site:</p> <ul style="list-style-type: none"> Water courses of plain to montane levels with the Ranunculion fluitantis and Callitriche-Batrachion vegetation <p>Annex II species that are a primary reason for selection of this site:</p> <ul style="list-style-type: none"> Marsh fritillary butterfly <i>Euphydryas (Eurodryas, Hypodryas) aurinia</i> Sea lamprey <i>Petromyzon marinus</i> Brook lamprey <i>Lampetra planeri</i> River lamprey <i>Lampetra fluviatilis</i> Atlantic salmon <i>Salmo salar</i> Otter <i>Lutra lutra</i> Floating water-plantain <i>Luronium natans</i> 														
Ramsar sites	7	There are no Ramsar sites within 20 km of the site.														
Sites of Special Scientific Interest (SSSI)	8	<p>There are 445 SSSI's within the North West of which 278 are situated within Cumbria. The condition of the SSSI land in England is assessed by Natural England. There are six reportable condition categories: favourable; unfavourable recovering; unfavourable no change; unfavourable declining; part destroyed and destroyed.</p> <p><u>Condition Summary of SSSI's in the North West Region (445 SSSI's)</u></p> <table border="1"> <thead> <tr> <th>% Area meeting</th> <th>% Area favourable</th> <th>% Area unfavourable</th> <th>% Area unfavourable</th> <th>% Area unfavourable</th> <th>% Area destroyed /</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			% Area meeting	% Area favourable	% Area unfavourable	% Area unfavourable	% Area unfavourable	% Area destroyed /						
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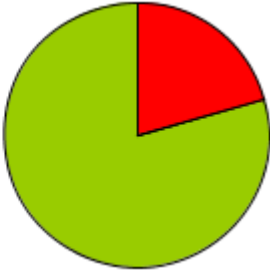
Indicator	Data Source	Current Data		Comparators			Trend												
		PSA11 target		recovering	no change	declining	part destroyed												
		88.94%	48.50%	40.44%	8.91%	2.13%	0.02%												
<div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"> <ul style="list-style-type: none"> ■ % Area favourable ■ % Area unfavourable recovering ■ % Area unfavourable no change ■ % Area unfavourable declining ■ % Area destroyed / part destroyed </div>  </div> <p>Condition Summary of SSSI's in Cumbria (278 SSSI's)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>% Area meeting PSA target</th> <th>% Area favourable</th> <th>% Area unfavourable recovering</th> <th>% Area unfavourable no change</th> <th>% Area unfavourable declining</th> <th>% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>85.68%</td> <td>35.54%</td> <td>50.14%</td> <td>11.21%</td> <td>3.07%</td> <td>0.03%</td> </tr> </tbody> </table>								% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	85.68%	35.54%	50.14%	11.21%	3.07%	0.03%
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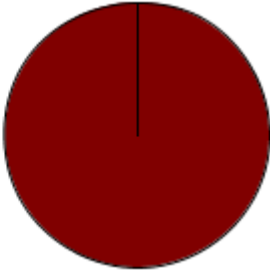
¹¹ PSA Target = The Government's Public Service Agreement (PSA) target to have 95% of the SSSI area in favourable or recovering condition by 2010.

Indicator	Data Source	Current Data	Comparators	Trend
				<p>There are 40 SSSI within 20km of the site, 6 are within 5km. These are:</p> <ul style="list-style-type: none"> • Silver Tarn, Hollas and Harnsey Mosses, immediately adjacent to the north-west of the site. • Low Church Moss, approximately 0.8km south-east of the site. • Haile Great Wood SSSI, approximately 3.5km north east of the site • Florence Mine SSSI, approximately 3.5km north east of the site • Black Moss SSSI, approximately 4km north east of the site • St. Bees Head, approximately 4.5km north-west of the site <p>A further 3 SSSIs are within 10km:</p> <ul style="list-style-type: none"> • Drigg Coast, approximately 7km south-east of the site. • River Ehen (Ennerdale Water to Keekle Confluence) SSSI, approximately 5.8km to the north • Hallsenna Moor, approximately 8km south-east of the site.
Drigg Coast SSSI	9	<p>Drigg Coast SSSI extends for almost 11 km along the West Cumbrian coast and supports a very broad range of maritime habitats, including an extensive sand dune system and saltmarsh. These habitats support a rich and varied flora including several species of local or nationally rare distribution. Fauna includes nationally important invertebrate species, one of the two largest natterjack toad colonies in England, as well as populations of all four common amphibians and the great crested newt. Adder, slow worm and common lizard also inhabit the sand dune system.</p>		

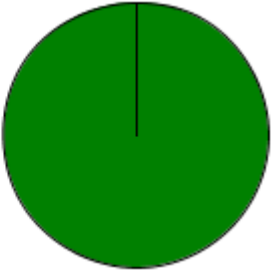
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		<p>Condition Summary: Drigg Coast SSSI</p> <table border="1"> <thead> <tr> <th>% Area meeting PSA target</th> <th>% Area favourable</th> <th>% Area unfavourable recovering</th> <th>% Area unfavourable no change</th> <th>% Area unfavourable declining</th> <th>% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>93.19%</td> <td>90.12%</td> <td>3.07%</td> <td>4.53%</td> <td>2.27%</td> <td>0.00%</td> </tr> </tbody> </table> <div style="display: flex; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin-right: 20px;"> <ul style="list-style-type: none"> ■ % Area favourable ■ % Area unfavourable recovering ■ % Area unfavourable no change ■ % Area unfavourable declining ■ % Area destroyed / part destroyed </div>  </div>				% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	93.19%	90.12%	3.07%	4.53%	2.27%	0.00%
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93.19%	90.12%	3.07%	4.53%	2.27%	0.00%												
Low Church Moss SSSI	10	<p>This wetland area supports a variety of habitats that are very scarce on the intensively farmed West Cumbria coastal plain. These habitats include wet heath, acidic marshy grassland, tall fen and swamp, willow scrub a transition between poor fen and open water. The site has a rich invertebrate fauna, with several species scarce in Cumbria.</p> <p>Condition Summary: Low Church Moss SSSI</p> <table border="1"> <thead> <tr> <th>% Area meeting PSA target</th> <th>% Area favourable</th> <th>% Area unfavourable recovering</th> <th>% Area unfavourable no change</th> <th>% Area unfavourable declining</th> <th>% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>100.00%</td> </tr> </tbody> </table>				% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
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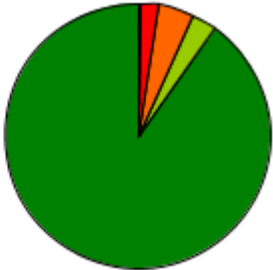
Indicator	Data Source	Current Data	Comparators	Trend												
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<p>Haile Great Wood SSSI</p>	<p>11</p>	<p>Haile Great Wood is a 32.2 hectare area of ancient woodland, occupying the sheltered, steep-sided valley of the Kirk Beck, some 5km from the west Cumbrian coast. This ancient wood lies between 70 and 140m O.D. and comprises a variety of woodland types which reflect the complex geology of the area, including hazel and birch-sessile oak stands, ash-hazel-oak stands on steep valley sides, and alder stands on alluvial deposits in the valley bottom. This diverse woodland is of particular importance as there are no other comparable intact examples of ancient woodland in the West Cumbrian coastal lowlands.</p> <p>The ground flora is typical of acid oakwoods with a profusion of Bluebell <i>Hyacinthoides non-scripta</i> in spring and a variety of characteristic grasses and herbs. Ash <i>Fraxinus excelsior</i> becomes frequent towards the valley bottom and in the southern section of the woodland, where it is found in association with Wych Elm <i>Ulmus glabra</i>, Hawthorn <i>Crataegus monogyna</i>, Hazel <i>Corylus avellana</i> and Beech <i>Fagus sylvatica</i>. The ground flora is richer, with Dog's Mercury <i>Mercurialis perennis</i>, Ramsons <i>Allium ursinum</i>, Sanicle <i>Sanicula europaea</i>, Moschatel <i>Adoxa moschatellina</i>, Pignut <i>Conopodium majus</i> and Wood Anemone <i>Anemone nemorosa</i>. Several wet flushes add interest.</p> <p><u>Condition Summary: Haile Great Wood SSSI</u></p> <table border="1" data-bbox="568 1078 1733 1262"> <thead> <tr> <th data-bbox="568 1078 721 1219">% Area meeting PSA target</th> <th data-bbox="721 1078 891 1219">% Area favourable</th> <th data-bbox="891 1078 1111 1219">% Area unfavourable recovering</th> <th data-bbox="1111 1078 1335 1219">% Area unfavourable no change</th> <th data-bbox="1335 1078 1550 1219">% Area unfavourable declining</th> <th data-bbox="1550 1078 1733 1219">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td data-bbox="568 1219 721 1262">79.16%</td> <td data-bbox="721 1219 891 1262">0.00%</td> <td data-bbox="891 1219 1111 1262">79.16%</td> <td data-bbox="1111 1219 1335 1262">0.00%</td> <td data-bbox="1335 1219 1550 1262">20.84%</td> <td data-bbox="1550 1219 1733 1262">0.00%</td> </tr> </tbody> </table>			% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	79.16%	0.00%	79.16%	0.00%	20.84%	0.00%
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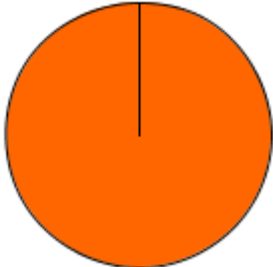
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Florence Mine SSSI	12	<p>Natural England's condition report (January 2009) states that pumping of the mine, and also therefore mining activities, have ceased. The underground features of the site are now flooded, and hence inaccessible. The SSSI is of geological interest, rather than biological. The mine previously provided excellent three-dimensional exposures through the largest 'flat'-type iron ore replacement body in the West Cumbria iron orefield.</p> <p><u>Condition Summary: Florence Mine SSSI</u></p> <table border="1" data-bbox="568 871 1733 1054" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #cccccc;">% Area meeting PSA target</th> <th style="background-color: #cccccc;">% Area favourable</th> <th style="background-color: #cccccc;">% Area unfavourable recovering</th> <th style="background-color: #cccccc;">% Area unfavourable no change</th> <th style="background-color: #cccccc;">% Area unfavourable declining</th> <th style="background-color: #cccccc;">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>100.00%</td> </tr> </tbody> </table>			% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%
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<p>Black Moss SSSI</p>	<p>13</p>	<p>Black Moss SSSI occupies a natural depression at an altitude of 90 m O.D, and comprises 16 hectares of lowland raised bog, the only example of this rare habitat in the locality. This is the most westerly example of lowland raised bog in England, and is unusual in that it still remains relatively intact and unmodified. The low domed structure of the peat body is clearly visible and where the margins of the mire are not bounded by peripheral or lagg watercourses there is a natural transition from acid mire to the vegetation of the surrounding mineral soils. Typical transitional communities at Black Moss include marginal fen and birch carr. In addition to the main bog communities Black Moss supports willow carr, peripheral woodland and scrub, acid marshy and semi-improved neutral grassland. A moderately wet bog community extends across the main body of the site dominated by Cross-leaved Heath <i>Erica tetralix</i> and Heather <i>Calluna vulgaris</i>. Other common species include Bilberry <i>Vaccinium myrtillus</i>, Cranberry <i>V. oxycoccus</i>, Purple Moor-grass <i>Molinia caerulea</i>, Common and Hair's-tail Cottongrass <i>Eriophorum angustifolium</i> and <i>E. vaginatum</i>. Together with the moss <i>Acrocladium cuspidatum</i> these combine to form a complex of hummocks with low lying areas or hollows comprising various bog-mosses <i>Sphagnum</i> spp. Also associated with these lawns are Bog Asphodel <i>Narthecium ossifragum</i> and Round-leaved Sundew <i>Drosera rotundifolia</i>.</p> <p><u>Condition Summary: Black Moss SSSI</u></p>		

Indicator	Data Source	Current Data		Comparators			Trend												
		% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed												
		100.00%	21.28%	78.72%	0.00%	0.00%	0.00%												
		<p>Legend:</p> <ul style="list-style-type: none"> % Area favourable % Area unfavourable recovering % Area unfavourable no change % Area unfavourable declining % Area destroyed / part destroyed 																	
St. Bees Head SSSI	14	<p>The biological interest of the site is represented in a number of different 'habitats': natural cliff-top grassland and heath, sheer cliff face and cliff-fall rubble, shingle and wave-cut platform. The outstanding interest of this area lies, however, in the sheer cliffs which provide the only breeding site on the coast of Cumbria for a variety of colonial seabirds. These include over 2,000 pairs of guillemots along with lesser numbers of fulmar, kittiwake, razorbill, cormorant, puffin, shag and herring gull. The cliffs also support the only breeding site on the entire coast of England for black guillemots.</p> <p><u>Condition Summary: St. Bees Head SSSI</u></p> <table border="1"> <thead> <tr> <th>% Area meeting PSA target</th> <th>% Area favourable</th> <th>% Area unfavourable recovering</th> <th>% Area unfavourable no change</th> <th>% Area unfavourable declining</th> <th>% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>100.00%</td> <td>100.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> </tr> </tbody> </table>						% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	100.00%	100.00%	0.00%	0.00%	0.00%	0.00%
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<p>Drigg Coast SSSI</p>	<p>15</p>	<p>Drigg Coast SSSI extends for almost 11km along the West Cumbrian coast and supports a very broad range of maritime habitats, including an extensive sand dune system and saltmarsh. These habitats support a rich and varied flora including several species of local or nationally rare distribution. Fauna includes nationally important invertebrate species, one of the two largest Natterjack Toad colonies in England, as well as populations of all four common amphibians and the Great Crested Newt <i>Triturus cristatus</i>, Adder <i>Vipera berus</i>, Slow Worm <i>Anguis fragilis</i> and Common Lizard <i>Lacerta agilis</i> also inhabit the sand dune system.</p> <p>Condition Summary: Drigg Coast SSSI</p> <table border="1" data-bbox="568 895 1733 1078"> <thead> <tr> <th data-bbox="568 895 719 1034">% Area meeting PSA target</th> <th data-bbox="719 895 891 1034">% Area favourable</th> <th data-bbox="891 895 1111 1034">% Area unfavourable recovering</th> <th data-bbox="1111 895 1330 1034">% Area unfavourable no change</th> <th data-bbox="1330 895 1550 1034">% Area unfavourable declining</th> <th data-bbox="1550 895 1733 1034">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td data-bbox="568 1034 719 1078">93.19%</td> <td data-bbox="719 1034 891 1078">90.12%</td> <td data-bbox="891 1034 1111 1078">3.07%</td> <td data-bbox="1111 1034 1330 1078">4.53%</td> <td data-bbox="1330 1034 1550 1078">2.27%</td> <td data-bbox="1550 1034 1733 1078">0.00%</td> </tr> </tbody> </table>			% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	93.19%	90.12%	3.07%	4.53%	2.27%	0.00%
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River Ehen (Ennerdale Water to Keekle confluence) SSSI	16	<p>The River Ehen is on the western fringe of the Lake District. It forms the outfall from Ennerdale Water SSSI and flows some 20km before reaching the Irish Sea at Sellafield. For much of its upper length the River Ehen is classed as an oligotrophic, or nutrient-poor, river flowing over bryophyte-dominated substrates of shingle, pebbles and rock. Between Ennerdale Water and the confluence with the River Keekle at Cleator Moor the Ehen meanders across a narrow floodplain with extensive areas of riparian woodland and trees. This stretch of the river supports outstanding populations of the Freshwater Pearl Mussel <i>Margaritifera margaritifera</i>. Collectively, this is the largest known population of this species in England, and the third largest population in Britain. An important feature of this stretch of the Ehen is the amount of tree shade along the banks, as along with the oligotrophic status of the river, the shade from direct sunlight helps to reduce the amount of algal growth in the channel which would make it unsuitable for the mussels. <i>Margaritifera margaritifera</i> has a complex lifecycle, and maintenance and successful recruitment of the mussel populations is dependent on the well-being of the whole river system.</p> <p>Condition Summary: River Ehen (Ennerdale Water to Keekle confluence) SSSI</p> <table border="1" data-bbox="568 1046 1733 1241"> <thead> <tr> <th>% Area meeting PSA target</th> <th>% Area favourable</th> <th>% Area unfavourable recovering</th> <th>% Area unfavourable no change</th> <th>% Area unfavourable declining</th> <th>% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>0.00%</td> <td>0.00%</td> <td>0.00%</td> <td>100.00%</td> <td>0.00%</td> <td>0.00%</td> </tr> </tbody> </table>			% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%
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Indicator	Data Source	Current Data	Comparators	Trend												
		<div data-bbox="577 352 996 564" style="border: 1px solid black; padding: 5px; display: inline-block;"> <ul style="list-style-type: none"> ■ % Area favourable ■ % Area unfavourable recovering ■ % Area unfavourable no change ■ % Area unfavourable declining ■ % Area destroyed / part destroyed </div> <div data-bbox="1059 328 1330 596" style="display: inline-block; text-align: center;">  </div>														
Hallsenna Moor SSSI	17	<p>Hallsenna Moor is situated on the West Cumbrian coastal plain. The site is one of the few lowland heathland and peatland complexes remaining in the county and is the largest in west Cumbria. It contains a wide range of habitats developed on peat which form a mosaic including wet and dry heath, nutrient poor fen, basin mire and woodland. The site supports a rich invertebrate fauna and of particular note is the diversity of <i>Chrysomelid</i> and <i>Curculionid</i> beetles with over 60 species recorded.</p> <p><u>Condition Summary: Hallsenna Moor SSSI</u></p> <table border="1" data-bbox="568 863 1733 1050"> <thead> <tr> <th>% Area meeting PSA target</th> <th>% Area favourable</th> <th>% Area unfavourable recovering</th> <th>% Area unfavourable no change</th> <th>% Area unfavourable declining</th> <th>% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td>11.09%</td> <td>11.09%</td> <td>0.00%</td> <td>81.22%</td> <td>7.69%</td> <td>0.00%</td> </tr> </tbody> </table>			% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	11.09%	11.09%	0.00%	81.22%	7.69%	0.00%
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National Nature Reserves (NNR)	18	There are 31 NNR within the North West, 24 within Cumbria. The following NNR's are within 20km of the site: <ul style="list-style-type: none"> Hallsenna Moor High Leys 		
Local Nature Reserves (LNR)	19	There are 122 LNR within the North West, 9 within Cumbria. The following LNR is within 20km of the site: <ul style="list-style-type: none"> Drigs Dunes and Gullery, Ravenglass 		
Local Wildlife Sites	20	Information to be obtained from a local record centre at the appropriate time.		
Legally protected Species	21	The following legally protected species have been recorded within 10km of the site (please note this excludes terrestrial invertebrates for which there are a vast number of different species): EPS meaning European Protected Species: <ul style="list-style-type: none"> Great Crested Newt (EPS) Natterjack Toad (EPS) Common Species of Reptile (Adder, Slow Worm, Common Lizard and Grass Snake) Otter (EPS) 		

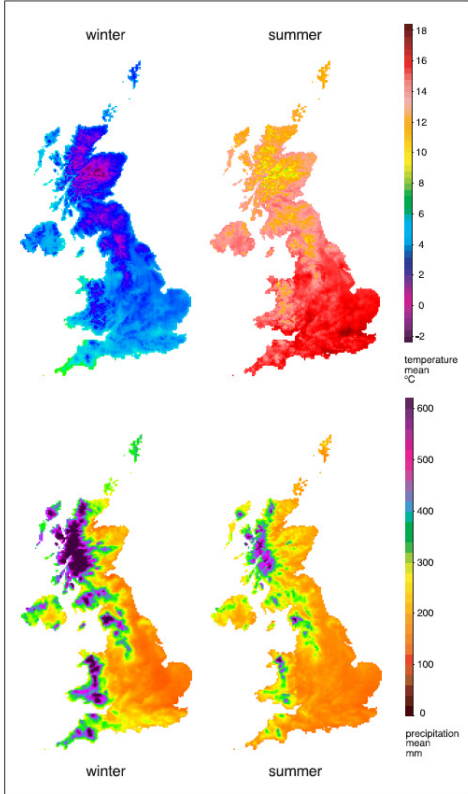
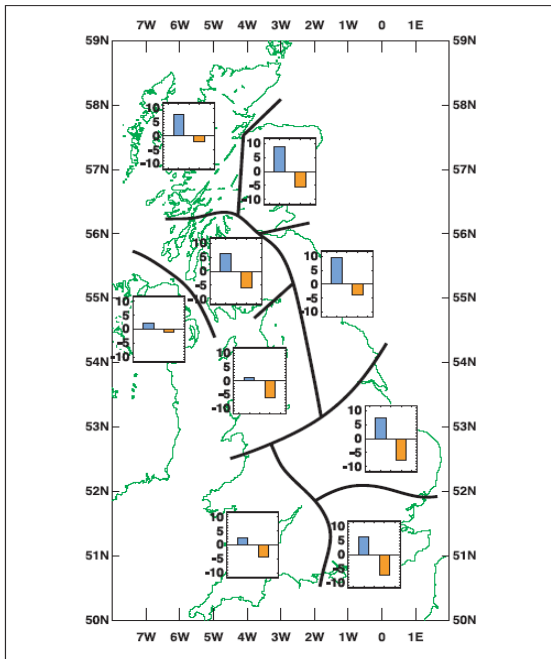
Indicator	Data Source	Current Data	Comparators	Trend
		<ul style="list-style-type: none"> • Badger • Red Squirrel 		

Key to Data Sources

1	Natural England (2008). North West Biodiversity. http://www.biodiversitynw.org.uk/default.asp
2	NWDA (2008). Cumbria Biodiversity Partnership. Cumbria Biodiversity Action Plan. http://www.wildlifeincumbria.org.uk/cbap/generic_biodiversity.asp
3	The UK Biodiversity Action Plan (2002). Cumbria Biodiversity Action Plan. http://www.ukbap.org.uk/lbap.aspx?ID=436
4	JNCC (August 2008) UK SAC Sites. http://www.jncc.gov.uk/page-1458
5	JNCC. Drigg Coast SAC – Site details. http://www.jncc.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0013031
6	JNCC. River Ehen SAC – Site details. http://www.jncc.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0030057
7	JNCC. UK Ramsar Sites. http://www.jncc.gov.uk/page-1389
8	Natural England. Regional and County SSSI details: http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&Category=R&Reference=North+West http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&Category=C&Reference=1009
9	Natural England. Silver Tarn, Hollas and Harnsey Mosses SSSI citation. http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1001998 Natural England, Silver Tarn, Hollas and Harnsey Mosses, Condition Summary. http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?report=sdrt18&category=S&reference=1001998
10	Natural England. Low Church Moss SSSI citation. http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1001117 Natural England. Low Church Moss, Condition Summary. http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?report=sdrt18&category=S&reference=1001117
11	Natural England. Haile Great Wood SSSI citation and SSSI condition summary: http://www.sssi.naturalengland.org.uk/special/sssi/sssi_details.cfm?sssi_id=1000897

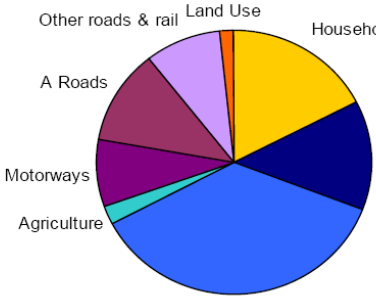
12	Natural England. Florence Mine SSSI citation and SSSI condition summary: http://www.sssi.naturalengland.org.uk/special/sssi/sssi_details.cfm?sssi_id=2000141
13	Natural England. Black Moss SSSI citation and SSSI condition summary: http://www.sssi.naturalengland.org.uk/special/sssi/sssi_details.cfm?sssi_id=1004396
14	Natural England. St. Bees Head SSSI citation. http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1001877 Natural England. St. Bees Head, Condition Summary. http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?report=sdrt18&category=S&reference=1001877
15	Natural England. Drigg Coast SSSI citation. http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1000077 Natural England. Drigg Coast Condition Summary. http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?report=sdrt18&category=S&reference=1000077
16	Natural England. River Ehen (Ennerdale Water to Keekle Confluence) SSSI citation and SSSI condition summary: http://www.sssi.naturalengland.org.uk/special/sssi/sssi_details.cfm?sssi_id=2000147
17	Natural England. Hallsenna Moor SSSI citation. http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1000927 Natural England. Hallsenna Moor, Condition Summary. http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?report=sdrt18&category=S&reference=1000927
18	Natural England. National Nature Reserves. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/regions/northwest.aspx
19	Natural England. Local Nature Reserves. http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_results.asp?N=&C=9&Submit=Search
20	National Federation for Biological Recording. Local records centres database. http://www.nbn-nfbr.org.uk/nfbr.php
21	National Biodiversity Network. http://www.nbn.org.uk/

Climate Change

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Climate Change				
<p>North West England, Region (Precipitation and Temperature)</p>	<p>1,2,3</p>	<p>Compared with the rest of England, Cumbria has a cold climate and winters are severe, with heavy snowfall in the mountains. This region is the wettest part of England and in the Lake District the average annual rainfall is over 2,540 mm (100 inches); elsewhere in the county it is in the region of 1,520-2,540 mm (60-100 in).</p> <p>The following trends have been observed in the North West Region:</p> <ul style="list-style-type: none"> • 0.4 °C rise in annual mean temperature at Manchester Airport between 1988 and 1997 (compared to the 1961 – 1990 30 year average) • 20% decrease in summer rainfall over the last century • Increase in high intensity rainfall since the 1960s • Seasonal rainfall varying by as much as 15% from the average in the last 30 years • Sea level rise at Liverpool of around 6cm in the last 50 years 	 <p>Figure 18: Average observed 1961-1990 winter and summer temperature (°C, top) and precipitation (mm, bottom) in the UK. Data on a 5 km grid.</p>	 <p>Figure 12: The trend (1961 to 2000) in the fraction of the total seasonal precipitation contributed by the "most intense" precipitation events in winter (left-hand bars) and in summer (right-hand bars) for a number of UK regions. Positive (blue) numbers indicate an increasing trend in the proportion of the total precipitation that comes from the "most intense" events, i.e., "most intense" events are increasing either in frequency or in intensity. The lower bound to the class of "most intense" events is defined (separately for each season and region) by an amount (mm) calculated from the 1961 to 1990 period, namely the daily precipitation exceeded on a minimally sufficient number of days necessary to account for precisely 10 per cent of the seasonal precipitation. [Source Tim Osborn]</p>

Indicator	Data Source	Current Data	Comparators	Trend
		<ul style="list-style-type: none"> • Increased flooding of some of the region's major rivers in the last few decades • Evidence of coastal erosion with potential serious consequences for this region (1909-2055 in the Merseyside region) <p>It is envisaged that extreme weather, such as heat waves, droughts, storms and floods, will become more frequent and more severe. This will have a major impact on the people, landscapes and businesses of Cumbria. The consequences predicated for the North West are:</p> <ul style="list-style-type: none"> • The frequency of extreme weather events, such as floods, droughts, and storms, is likely to increase in Cumbria, causing disruption to services, and affecting people's health and wellbeing • A rise in sea levels due to climate change-related events • A rise in temperature would put areas such as the Lake District National Park, part of the Yorkshire Dales National Park, the North Pennines, and the Solway Firth at risk of drought and deterioration of plant life and melting of snow caps • Large parts of Cumbria have been identified as key areas for mosquito habitation should temperatures increase. This could have profound implications on health, as mosquitoes can spread a range of diseases • It is possible that climate change could bring some benefits to Cumbria. An increase in temperature and hours of sunshine could help bring an increase in investment and spending to Cumbria's coastal resorts 		

Indicator	Data Source	Current Data	Comparators	Trend
Greenhouse Gas Emissions	3,6	<p>The recent NWRA Energy and Greenhouse Gas Emissions Inventory sets out the challenges facing Cumbria on climate change and they include:</p> <ul style="list-style-type: none"> • Of the 5 sub-regions, Cumbria has the lowest overall emissions (measured as CO₂ equivalent), but the highest per capita emissions (CO₂ equivalent), due mainly to its dispersed population and the need to travel by road; • CO₂ represents the greatest source of greenhouse gas emissions in Cumbria at 75%, but this figure is considerably lower than in other sub-regions (Greater Manchester – 91%, Merseyside 91%, Cheshire – 90%, Lancashire – 86%). This is due to a much higher contribution in Cumbria of methane (17%) and nitrous oxide (6%) emissions arising from agriculture and natural processes. • Cumbria is the only sub-region where transport is the largest sector contributing to carbon emissions (representing 28% of total emissions). 		
Cumbria County Council Greenhouse Gas Emissions	2,4,6,7	<p>The breakdown of CO₂ emissions in Cumbria is shown in the pie chart below. Total CO₂ emissions in the county amount to 7.4 million tonnes per year, of which 607,000 tonnes (8%) is attributed to traffic on the M6 (the accounting of emissions from the M6 should be omitted from local data). Just over 3.8 million tonnes (52%) are due to industry and commerce and, of this, 988,000 tonnes are emitted by 14 large manufacturing sites. Tourism accounts for between 750,000 and 1,080,000 tonnes (10-15% of total emissions).</p>		

Indicator	Data Source	Current Data	Comparators	Trend												
		<div data-bbox="562 316 1451 778" style="border: 1px solid black; padding: 10px;"> <p style="text-align: center;">Cumbria CO2 Emissions 2005 - kt CO2</p>  <table border="1" data-bbox="1077 544 1435 738" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2">Total CO2 Emissions:</td> </tr> <tr> <td colspan="2">7,420,000 tonnes</td> </tr> <tr> <td>Industry & Commerce</td> <td>52%</td> </tr> <tr> <td>Transport</td> <td>29%</td> </tr> <tr> <td>Households</td> <td>17%</td> </tr> <tr> <td>Land Use</td> <td>2%</td> </tr> </table> <p style="font-size: small;">Source: Defra LA Area CO2 Indicator Analysis, EU ETS</p> </div> <p data-bbox="555 810 1444 1150">The table below shows that emissions as a result of energy use in the industrial and domestic sectors are relatively high compared to national figures. For domestic emissions, households in the North West emit, on average, 6.2tCO₂Eqv, compared to a national average of 5.4tCO₂Eqv. This is despite above average levels of fuel poverty in the region, and is likely to reflect the age and quality of the housing stock. Other sources of CO₂ emissions; from industrial processes, waste and agriculture; are comparatively small. However, of the other greenhouse gases, it is worth noting that the North West accounts for just over 30% of national emissions of Hydroflourocarbons (HFCs) as a result of production facilities in the region.</p>	Total CO2 Emissions:		7,420,000 tonnes		Industry & Commerce	52%	Transport	29%	Households	17%	Land Use	2%		
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Indicator	Data Source	Current Data		Comparators		Trend	
			UK CO ₂ emissions (thousand tonnes)	NW CO ₂ emissions (thousand tonnes)	% of UK emissions (for that sector)		% of regional total emissions
		Domestic	133,802.67	18,506.67	13.83	29.73	
		Industrial	97,177.84	13,787.43	14.19	22.15	
		Services	58,445.15	6,148.31	10.52	9.88	
		Energy transformation	39,948.80	3,781.05	10.82	6.07	
		Energy Industry use	45,370.78	2,959.39	6.52	4.75	
		Fugitive emissions	20,258.24	1,751.01	8.64	2.81	
		Other	9,507.55	1,116.17	11.74	1.79	
		Transport	128,134.07	14,189.54	11.07	22.8	
		TOTAL	527,645.10	62,239.56	11.80		
		<p>Cumbria Strategic Partnership has signed up to the Local Area Agreement indicator NI 186 to reduce per capita CO₂ emissions across Cumbria as a whole, excluding emissions from large industry, motorways, large scale renewables and excluding 'indirect emissions' from food or imported goods into the county. The target is 11.5% savings by 2010/11, which equates to savings of 619,000 tonnes CO₂ per year. Of this, national initiatives are assumed to contribute 7.75%, leaving 3.75% to be achieved by local actions, or the local component of national programmes. This equates to around 202,000 tonnes CO₂ per year. The baseline CO₂ emissions for Cumbria for this indicator are 5,379,000 tonnes, split by district and sector as shown below.</p>					

Indicator	Data Source	Current Data	Comparators				Trend	
		CO2 emissions (kt CO2) 2005 by End User						
		Industry and Commercial (not inc ETS installations or diesel railways)	Domestic	Road Transport (not including motorways)	Total emission for indicator	Population Thousands	Per capita Total CO2 (tonnes)	
		Local Authority						
		Allerdale	748	258	280	1,286	94.4	13.6
		Barrow-in-Furness	396	162	70	628	71.9	8.7
		Carlisle	406	269	245	919	102.9	8.9
		Copeland	240	182	120	542	70.0	7.7
		Eden	475	137	293	905	51.7	17.5
		South Lakeland	440	301	359	1,099	104.9	10.5
		CUMBRIA TOTAL	2,704	1,309	1,366	5,379	496	10.85
		TOTAL NORTH WEST	22,137	17,062	9,647	48,845	6,840	7.1
		UK TOTAL	191,654	151,278	104,651	447,583	60,238	7.4
		<p>The site is located in the Copeland Local Authority (4th row from the top).</p> <p>The Cumbria Climate Change Strategy states that locally the electricity network remains vulnerable to the impacts of severe storms, particularly in rural areas, and the grid is insufficiently flexible to accommodate new connections.</p>						

Indicator	Data Source	Current Data	Comparators	Trend								
Copeland Borough Council Greenhouse Gas Emissions	2,7	Local Authority and Government Office Region	Industry and Commercial	Domestic	Road Transport	Land use change and forestry	Total	Population Thousands ⁽¹⁾	Per capita Total CO2 (tonnes)	Domestic per capita CO2 (tonnes)		
		Allerdale	804	254	305	41	1404	93	15.0	2.7		
		Barrow-in-Furness	323	159	75	5	563	72	7.8	2.2		
		Carlisle	480	265	363	25	1132	101	11.2	2.6		
		Copeland	290	179	132	4	606	69	8.7	2.6		
		Eden	803	135	628	26	1593	50	32.0	2.7		
		South Lakeland	500	296	589	23	1409	102	13.8	2.9		
		TOTAL NORTH WEST	27201	16872	16637	607	61317	6730	9.1	2.5		
<p>Cumbria is a relatively large emitter of CO₂ per capita, due largely to having a large land mass and sparse population. Rural populations are heavily reliant on travelling by car as the primary source of transport, and in the more rural areas of the county there is reliance on oil/coal for domestic heating.</p>												
Topic: Energy												
Energy	8,9,10	<p><u>Electricity Consumption 2007 (Copeland)</u></p> <p>Overall: 263.2 GWh (0.08% of UK)</p> <p>Average Domestic Consumption: 4,397 kWh</p> <p>Average Industrial Consumption: 42,281 kWh</p> <p><u>Total Energy Consumption 2006 (Copeland)</u></p> <p>1,447.3 GWh</p>						<p>Copeland's electricity consumption accounts for less than 0.1% of Britain's electricity consumption.</p> <p>18% of Copeland's energy consumption comes from electricity.</p> <p>The Regional Spatial Strategy for North West England seeks to:</p> <ul style="list-style-type: none"> Promote and exploit low carbon and renewable energy technologies and 				

Indicator	Data Source	Current Data	Comparators	Trend
		<p><u>Electricity Consumption 2007 (North West England)</u></p> <p>Overall: 35,352.7 GWh</p> <p>Average Domestic Consumption: 4,226 kWh</p> <p>Average Industrial Consumption: 91,275 kWh</p> <p><u>Electricity Consumption 2007 (Great Britain)</u></p> <p>Overall: 309,669.5 GWh</p> <p>Average Domestic Consumption: 4,392 kWh</p> <p>Average Industrial Consumption: 79,077 kWh</p> <p><u>Total Energy Consumption 2006</u></p> <p>North West England: 200,208.9 GWh</p> <p>UK: 2,120,261.5 GWh</p>		<p>increase the amount of electricity and energy for heating from renewable sources supplied and consumed within the Region.</p> <ul style="list-style-type: none"> • Policy EM 18: Decentralised Energy Supply Plans and strategies should encourage the use of decentralised and renewable or low-carbon energy in new development [...]
Renewable Energy	8,10	<p><u>Energy Consumption from Renewable Sources 2006 (Copeland)</u></p> <p>6.2 GWh (0.4%)</p> <p><u>Total Energy Consumption from Renewable Sources 2006</u></p> <p>North West England: 701.4 GWh (0.35%)</p> <p>UK: 6,939.5 GWh (0.3%)</p>		<p>The Regional Spatial Strategy (RSS) for North West England states:</p> <ul style="list-style-type: none"> • Policy DP 9: [...] Measures to reduce emissions might include as examples: Increasing renewable energy capacity [...] • Policy EM 17: Renewable Energy By 2010 at least 10% of electricity supplied within the region should come from renewable energy sources (15% by 2015, 20% by 2020). <p>The North West Sustainable Energy Strategy states:</p> <ul style="list-style-type: none"> • The North West possesses some of the best renewable energy resources in the

Indicator	Data Source	Current Data	Comparators	Trend
				<p>UK.</p> <ul style="list-style-type: none"> It also contains some of its most beautiful and ecologically fragile landscapes, which are particularly sensitive to the siting of some renewable energy technologies.
Current Capacity	11,12	<p>Sellafield B power station has a capacity of 1,188 MW. It is expected to operate until 2035.</p> <p>Sellafield A Power Station ceased operation in 2006 and had a power output of 420 MW.</p> <p>Other power stations in the vicinity include:</p> <ul style="list-style-type: none"> Rosecote Power Station: CCGT, 229 MW, 48 km Heysham 1 and 2 Power Stations: Nuclear, 1,150 MW and 1,250, 80 km 		

Key to Data Sources

1	<p>MSN Encarta. Cumbria. http://uk.encarta.msn.com/encyclopedia_761563762/cumbria.html</p>
2	<p>North West Climate Group (2005). Climate Change in the Northwest and its impacts: a summary document¹² http://www.climatechangenorthwest.co.uk/assets/files/documents/jun_07/cli_1181141206_Climate_Change_in_the_Northwes.pdf</p>
3	<p>Report on Coastal Erosion predictions for Formby Point, Formby, Merseyside http://www.sefton.gov.uk</p>

¹² Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

4	Cumbria Vision, Cumbria Strategic Partnership and North West Development Agency (2008). The Economic Implications of Climate Change Legislation for Cumbria. http://www.cumbriastrategicpartnership.org.uk/elibrary/view.asp?id=28146
5	Lake District National Park Authority, Cumbrian Environment and Heritage Thematic Partnership (2008). Delivery Plan for Climate Change Indicator NI186. http://www.cumbriastrategicpartnership.org.uk/elibrary/view.asp?id=%2027753
6	Cumbria Vision (2008). Cumbria Economic Strategy 2008- 2028, Energy and Environmental Technologies – Strategic Action Plan No.1. http://www.copeland.gov.uk/CIS/pdf/210808_oscede6_App1.pdf
7	Cumbria County Council and Cumbria Strategic Partnership (2008). Cumbria climate change strategy – Draft for consultation. http://www.lake-district.gov.uk/lake_district_docs95/2008_03_07_cumbria_climate_change_strategy_draft_for_consultation.pdf
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11	BERR (2009). Nuclear Power Stations. http://www.berr.gov.uk/energy/sources/nuclear/key-issues/power-stations/page47765.html/sources/nuclear/key-issues/power-stations/page47765.html
12	Wikipedia (2008). Power Stations in the North West. http://en.wikipedia.org/wiki/Category:Power_stations_in_North_West_England

¹³ Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

Communities: Population and Economy

Indicator	Data Source	Current Data				Comparators	Trend
Topic: Population							
Age of population	1, 2,4		Beckermet	Copeland (Non-Metropolitan District)	North West	England	The North West had a population of 6.9 million in 2006. This was 80,000 more compared with mid-2001 and a decrease of 1.3% since 1981. The largest percentage change was a 20% increase in Eden.
		All People (Count)	2,740	69,318	6,729,764	49,138,831	
		People aged 0-4 (%)	5.04	5.37	5.88	5.96	
		People aged 5-7 (%)	3.83	3.57	3.78	3.74	
		People aged 8-9 (%)	2.81	2.60	2.74	2.61	
		People aged 10-14 (%)	6.31	6.84	6.93	6.57	
		People aged 15 (%)	1.35	1.34	1.37	1.27	
		People aged 16-17 (%)	2.63	2.59	2.66	2.51	
		People aged 18-19 (%)	2.08	2.23	2.47	2.40	
		People aged 20-24 (%)	3.61	4.78	5.79	6.01	
		People aged 25-29 (%)	4.42	5.70	6.18	6.65	
		People aged 30-44 (%)	22.26	22.78	22.09	22.65	
		People aged 45-59 (%)	22.74	20.12	19.06	18.88	
		People aged 60-64 (%)	6.61	6.65	5.09	4.87	
		People aged 65-74 (%)	9.16	9.28	8.59	8.35	
People aged	5.77	5.59	5.55	5.60			

Indicator	Data Source	Current Data			Comparators		Trend
		75-84 (%)					
		People aged 85-89 (%)	0.95	1.05	1.24	1.30	
		People aged 90 and over (%)	0.44	0.52	0.61	0.64	
		Mean age of population in the area	40.77	39.61	38.61	38.60	
		Median age of population in the area	42.00	39.00	38.00	37.00	
<p>The population of Beckernet and Copeland are older than the national and regional average. In Beckermett about 7.2% of the population is aged over 75 years, with 1.4% aged over 85 years.</p>							
<p>People aged 65 years and older make up approximately 16.4% of the Copeland population. This is higher than the national average.</p>							
<p>The population of Copeland is 70,300 - 2006 mid-year estimate (69,318 in 2001 Census).</p>							
<p>Of this 70,300 population, 12,800 are aged 0 to 15, 43,200 are of working age, and 14,300 are older than working age. The mean average age is 40 years old compared with an average age of 39 for England and Wales. 2.2% of the resident population is retired compared with 13.2% in England and Wales overall. The Borough has low numbers of resident ethnic minority groups, and the population is overwhelmingly 'white' (Census classification), with 99.3% of the resident population belonging to this category. Although two thirds of the Borough lies within the Lake District National Park, around a mere 4000 people live there.</p>							

Topic: Employment						
Indicator	Data Source	Current Data		Comparators		Trend
Percentage Economically Active – Employed %	1, 2,3,4	Beckermet	Copeland (Non-Metropolitan District)	North West	England	
		Full Time 39.52	37.26	38.77	40.81	
		Part Time 11.22	12.80	11.87	11.81	
		In the second quarter of 2007 the employment rate (for people of working age) in the North West was 73%, slightly lower than the UK rate of 74%. Full time employment levels at ward level are higher than the regional level but lower than the national level. Full time employment levels at district level are lower than the national and regional average. Part time employment levels at ward level are below the regional and national level, they are higher at the district level.				
Percentage Economically Active – unemployed %		Beckermet	Copeland (Non-Metropolitan District)	North West	England	
		3.72	5.02	3.63	3.35	
		Unemployment levels are higher at both the ward and district levels than the regional and national level.				
Industry of employment		Beckermet	Copeland (Non-Metropolitan District)	North West	England	
All persons		100% (1,243)	100% (29,222)	100% (2,900,020)	100% (22,441,498)	
Agriculture/ Forestry (%)		6.60	2.87	1.22	1.45	
Fishing (%)		0.00	0.05	0.01	0.02	
Mining (%)		0.56	0.35	0.16	0.25	

Indicator	Data Source	Current Data		Comparators		Trend
Manufacturing (%)		31.13	27.19	16.89	14.83	
Electricity/Gas/Water Supply (%)		3.54	3.35	0.77	0.71	
Construction (%)		8.77	8.97	6.49	6.76	
Wholesale/Retail Trade (%)		8.69	12.33	17.82	16.85	
Hotels/Restaurant (%)		6.44	5.99	5.13	4.73	
Transport/Communications (%)		3.78	3.84	6.79	7.09	
Financial (%)		0.97	1.06	3.77	4.80	
Real Estate (%)		7.96	8.20	10.80	13.21	
Public Admin (%)		2.82	4.92	5.68	5.66	
Education (%)		6.92	6.21	7.95	7.74	
Health and Social Work (%)		9.81	10.93	11.97	10.70	
Other (%)		2.01	3.73	4.54	5.20	
Self Employed (%)		9.68	6.40	7.10	8.32	
Socio-Economic Classifications 2001 (% Persons aged 16-74)		Beckermet	Copeland (Non-Metropolitan District0	North West	England	
Large employers and higher managerial		5.01	2.64	2.86	3.50	

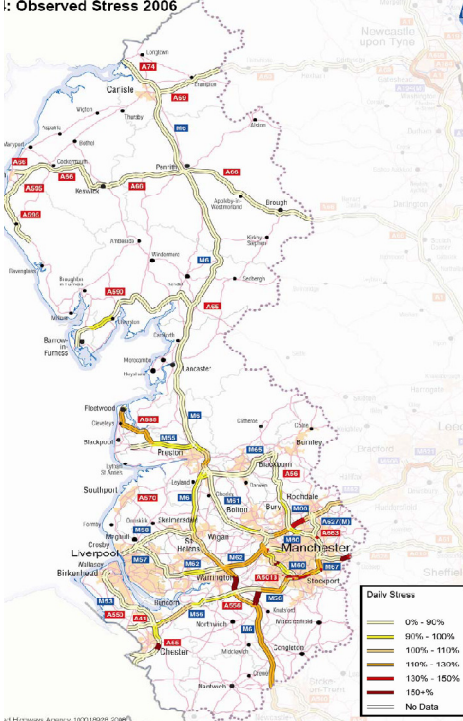

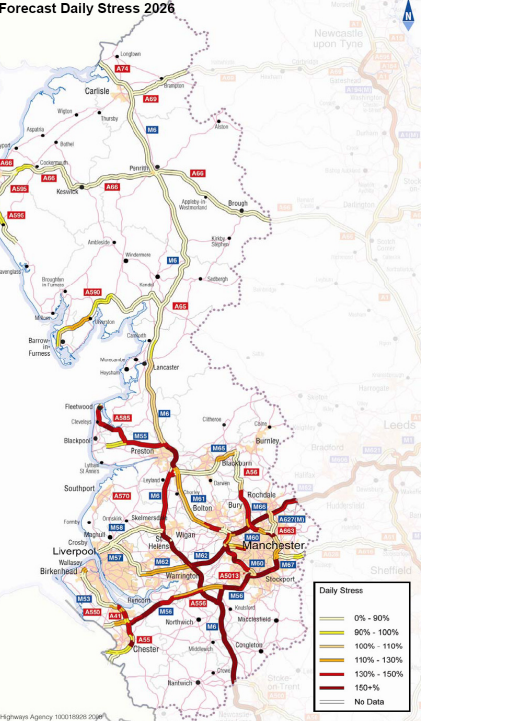
occupations					
Higher professional occupations		4.72	3.09	4.17	5.11
Lower managerial and professional occupations		16.63	13.96	16.78	18.73
Semi-routine occupations		10.87	13.01	12.17	11.65
Routine occupations		8.49	11.73	9.82	9.02
Never Worked		1.54	2.65	3.13	2.72
Full-time students		4.27	4.04	6.97	7.03
		<p>According to the 2001 Census, the unemployment rate in Copeland is 5%. 41% of the population was working in 2001. Of the 28618 jobs in Copeland, around 50% of those depend on the nearby Sellafield nuclear facility. This includes those jobs on site, and those jobs which rely on the site.</p> <p>34% of the 16-74 year old population have no educational qualifications. This compares to a national average of 29%.</p>			

Key to Data Sources

1	Office for National Statistics. Neighbourhood Statistics 2001: Beckermat. http://neighbourhood.statistics.gov.uk/dissemination/LeadAreaSearch.do?a=7&r=1&i=1001&m=0&s=1236613640337&enc=1&areaSearchText=C A20+1PG&areaSearchType=14&extendedList=false&searchAreas=Search
2	National Statistics (2008). Regional Profile: North West. http://www.statistics.gov.uk/ci/nugget.asp?id=1127
3	Regional Intelligence Unit http://www.nwriu.co.uk/
4	Copeland Brough Council (2004). Copeland Fast Facts. http://www.copeland.gov.uk/default.aspx?Page=341

Communities: Supporting Infrastructure

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Transport				
Regional Freight Routes	1	<p>The strategic road transport routes in the vicinity comprise the A595(T) to the north and the A595 to the south, and the A66(T) that links the A595(T) with the M6. The A595 and A66 have been recently improved. The site is accessed from the A595 by the B5345 Cop Lane and unclassified roads or via other unclassified roads from the A595 through the village of Beckermat: Morass Road, Mill Lane, Nursery Road and Braystones Road. The A595(T) is part of the Strategic Road Network but is not part of the Trans-European Network (TEN). The M6 is the closest road of national significance but is some 50km away. The motorway can be accessed via the A595(T) at junction 43, the A66 at junction 40 and the A590 and junction 36. Access using the A66 is through the Lake District National Park and Keswick, and access using the A590 is via Broughton-in-Furness along winding roads.</p>		

Indicator	Data Source	Current Data	Comparators	Trend
		<p>Observed Stress 2006</p> 	<p>Forecast Daily Stress 2016</p> 	<p>Forecast Daily Stress 2026</p> 
<p>The Cumbrian West Coast railway and Braystones Station is immediately adjacent to the site. The railway currently provides transport for nuclear materials to the existing facilities at Sellafield.</p>				
<p>The nearest shipping links are located in Barrow, to the south.</p>				

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Waste				
Municipal Waste	2,3,4	<p>A total of 4,215,000 tonnes of wastes were generated in the North West of England in 2006/07. Landfill remains the predominant method of municipal waste disposal in the East of England, where 66% of waste was dealt with in this manner in 2007. During this period, 31% of municipal waste was recycled, with the remaining 3% incinerated.</p> <p>Cumbria County Council acts as the Waste Disposal Authority (WDA) for Copeland Borough Council. In 2006/07 351,403 tonnes of municipal wastes were generated within the area. Of this total, 68% was sent to landfill, and the remaining 32% recycled. A relatively insignificant proportion (25 tonnes) was incinerated during this period.</p> <p>Cumbria's seven local authorities have formed the Cumbria Strategic Waste Partnership (CSWP). The County Council is currently in the process of procuring MBT (Mechanical Biological Treatment) waste treatment plant for sites at Carlisle and Barrow (contract currently approved). Two MBT plants will provided for the region, with a treatment capacity of 70,000 tonnes of waste each.</p> <p>There are currently three non-hazardous landfill sites in the region. No detailed information exists as to their projected capacity. There are currently no hazardous waste landfills or treatment facilities in the Cumbrian region, although established waste management contractors are known to operate and provide services within the region.</p>		<p>Over the period 2000/01 to 2006/07, there has been an overall increase of just over 2% in the amount of municipal wastes generated in the North West of England, rising from 4,125,000 tonnes to 4,215,000, peaking at 4,380,000 tonnes in 2003/04 and steadily declining since.</p> <p>There has however been a consistent and noticeable reduction in the amount of wastes disposed of at landfill sites, down from 90% in 2000/01 to 66% in 2006/07. This reduction largely correlates with the increase in recycling rates across the region, particularly as the amount of municipal wastes treated at Energy from Waste (EfW) plants has largely remained the same throughout that period at 1%.</p>
Radioactive and Hazardous Waste		<p>The operation of a new nuclear power station at the site will require the interim storage of spent fuel and intermediate level waste on site for a period of approximately 100 years after operation has ceased. The arrangements for dealing with all types of radioactive and hazardous waste arising from the operation and decommissioning of new power stations, (including gaseous and liquid radioactive discharges), are appraised in Chapter 6 of the Main AoS Report.</p>		

Key to Data Sources

1	Highways Agency (2008) Regional Network Report for North West http://www.highways.gov.uk/business/documents/RNR08_NW.pdf
2	Defra (November 2007) Municipal Waste Management. http://www.defra.gov.uk/environment/statistics/wastats/bulletin07.htm
3	Essex County Council (A Joint Municipal Waste Management Strategy for Essex (2007 to 2032) http://www.essexcc.gov.uk/vip8/ecc/ECCWebsite/content/binaries/documents/ESSEX_WASTE_STRATEGY_V3.pdf?channelOid=null
4	Urban Mines Municipal Waste Procurement webpage: http://www.urbanmines.org.uk/?i=1459&s=1111 [accessed 18 March 09]

Human Health and Well-Being

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Human Health & Well-Being				
Community well-being	1	<p>A useful gauge of the overall well-being of the area can be obtained from the various deprivation indices on the Office of National Statistics, Neighbourhood Statistics web page. This data compares the Super Output Area, Copeland 007A to England as a whole as follows:</p> <ul style="list-style-type: none"> • Income deprivation much less than average • Employment deprivation much less than average • Health deprivation less than average • Education deprivation less than average • Barriers to housing and services are greater than average • Crime is much less than average • Living environment deprivation is slightly less than average 		
Index of multiple deprivation (2007)	2	<p>The Department of Communities and Local Government's index of deprivation (an index combining a range of economic, social and housing issues into a single deprivation score) shows Copeland Borough Council's area ranked as 78 out of 354 (where 1 is most</p>	<p>Other borough councils in Cumbria are ranked as follows:</p> <ul style="list-style-type: none"> • Allerdale is 119 • Barrow-in-Furness is 29 <p>As can be seen from the above a number of</p>	

Indicator	Data Source	Current Data	Comparators	Trend																				
		deprived). This ranking shows that the Copeland area is deprived.	council areas in Cumbria are deprived with Barrow-in-Furness, which is adjacent to Copeland, being one of the most deprived areas in England.																					
Age profile (mid 2006)	1	<p>In the Super Output Area, Copeland 007A the age profile of the population is as follows:</p> <table border="1"> <thead> <tr> <th>Age Band (years)</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0 – 15</td> <td>18.2</td> </tr> <tr> <td>16 – 64 (males)</td> <td rowspan="2">57.5</td> </tr> <tr> <td>16 – 59 (females)</td> </tr> <tr> <td>65+ (males)</td> <td rowspan="2">24.3</td> </tr> <tr> <td>60+ (females)</td> </tr> </tbody> </table>	Age Band (years)	Percentage	0 – 15	18.2	16 – 64 (males)	57.5	16 – 59 (females)	65+ (males)	24.3	60+ (females)	<p>These figures compare to the age profile for the UK as a whole in 2006 as follows:</p> <table border="1"> <thead> <tr> <th>Age Band (years)</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0 – 15</td> <td>20.1</td> </tr> <tr> <td>16 – 64 (males)</td> <td rowspan="2">61.6</td> </tr> <tr> <td>16 – 59 (females)</td> </tr> <tr> <td>65+ (males)</td> <td rowspan="2">18.3</td> </tr> <tr> <td>60+ (females)</td> </tr> </tbody> </table> <p>As can be seen from the tables, there is a much smaller proportion of people in the lower age bracket and a much higher proportion of people in the upper age bracket (retired or approaching retirement) in the Super Output Area, Copeland 007A than in the UK as a whole. There are also proportionately fewer people of working age in the area.</p>	Age Band (years)	Percentage	0 – 15	20.1	16 – 64 (males)	61.6	16 – 59 (females)	65+ (males)	18.3	60+ (females)	
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General health (2001)	1	<p>For the census in 2001, people were asked whether their health over the preceding twelve months was 'good', 'fairly good' or 'not good'. The results for the Super Output Area, Copeland 007A were as follows:</p> <ul style="list-style-type: none"> Good – 65.44% 	<p>For comparison purposes, the same data for the overall Copeland area and England are as below:</p> <table border="1"> <thead> <tr> <th></th> <th>Copeland</th> <th>England</th> </tr> </thead> <tbody> <tr> <td>Good</td> <td>66.7</td> <td>68.8</td> </tr> <tr> <td>Fairly good</td> <td>22.9</td> <td>22.2</td> </tr> <tr> <td>Not good</td> <td>10.3</td> <td>9.0</td> </tr> </tbody> </table>		Copeland	England	Good	66.7	68.8	Fairly good	22.9	22.2	Not good	10.3	9.0									
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Indicator	Data Source	Current Data	Comparators	Trend												
		<ul style="list-style-type: none"> Fairly good – 25.43% Not good – 9.13% 	Overall there are more people reporting good health in the Super Output Area, Copeland 007C than in England as a whole although the percentage reporting poor health is similar.													
Life expectancy at birth (Jan 04 – Dec 06)	1	<table border="1"> <thead> <tr> <th></th> <th>Copeland</th> </tr> </thead> <tbody> <tr> <td>Males</td> <td>76.50</td> </tr> <tr> <td>Females</td> <td>80.60</td> </tr> </tbody> </table>		Copeland	Males	76.50	Females	80.60	<table border="1"> <thead> <tr> <th>NW of England</th> <th>England</th> </tr> </thead> <tbody> <tr> <td>75.80</td> <td>77.32</td> </tr> <tr> <td>80.30</td> <td>81.55</td> </tr> </tbody> </table> <p>As can be seen from above, the life expectancy in the Copeland Borough Council area is slightly below the national average for England.</p>	NW of England	England	75.80	77.32	80.30	81.55	Data from the same source for previous years show that these figures for life expectancy at birth in the Copeland Borough Council area have risen slightly for both males and females since 2001.
	Copeland															
Males	76.50															
Females	80.60															
NW of England	England															
75.80	77.32															
80.30	81.55															
Infant mortality (Jan 03 – Dec 05)	1	Infant mortality in the Copeland Borough Council area for the years in question was 5.2 persons in every 1000.	This compares to the figure of 4.2 persons for the North West of England and 5.1 persons per thousand in England as a whole.	Data from the same source for previous years show that figures for infant mortality in the Copeland Borough Council area have decreased since 1998-2000.												
Proximity to medical services	3	<p>Medical services in the area of the site are as follows:</p> <ul style="list-style-type: none"> Four General Practitioner (GP) practices within 8km (5 miles) of the site. Closest hospital is the West Cumberland Hospital (approximately 10km) at Whitehaven and this hospital has an Accident and Emergency (Accident and Emergency) department 														

Indicator	Data Source	Current Data	Comparators	Trend
		<ul style="list-style-type: none"> Acute mental health units are available in Whitehaven, Carlisle, Kendal and Barrow-in-Furness 		
Education - examination results for young people (2006 – 07)	1	In the Super Output Area, Copeland 007A, there is no data available on the percentage of pupils that achieved 5 or more A* - C grade passes including English and Mathematics at GCSE or equivalent. However, in the Copeland Borough Council area 54% of students achieved this standard.	This compares to the figure of 46% of students for England as a whole.	
Housing – total unfit dwellings (Apr 06)	1	The total percentage of unfit dwellings in the Copeland Borough Council area for the year in question was 5.5%.	This compares to a percentage of 5.2% for the North West of England and 4.2% for England as a whole.	Data from the same source show that the percentage of unfit dwellings has reduced since April 2001.
Radio-activity monitoring	4	<p>The Food Standards Agency's annual RIFE (Radioactivity In Food and the Environment) report details the results of regular radiological monitoring carried out to ensure that discharges of radioactivity do not result in unacceptable doses to the public. RIFE 13 relates to monitoring carried out in 2007. From this report it is possible to extract the following conclusions:</p> <ul style="list-style-type: none"> The power station at Sellafield (Calder Hall) ceased operation in 2003 Concentrations of all radionuclides associated with gaseous discharges from the site were low Concentrations of artificial 	<p>The dose limit for members of the public specified in The Ionising Radiation Regulations 1999 is 1 millisievert (mSv) per year for all artificial sources of radiation.</p> <p>Estimations of dosage levels to the public from the Sellafield sampling were as follows:</p> <ul style="list-style-type: none"> Estimated dose from locally grown foodstuffs (on land with seaweed added) was 0.012 mSv Estimated dose to local fish and shellfish consumers (using personal habits derived in 2007) was 0.46 mSv (where 0.21 mSv was assessed as being due to nuclear industry discharges) The total dose from all sources, including direct radiation, was assessed as being 	<p>Trends in the data noted from sampling in previous years are as follows:</p> <ul style="list-style-type: none"> Estimated dose from locally grown foodstuffs (on land with seaweed added) was 0.013 mSv Estimated dose to local fish and shellfish consumers (using personal habits derived in 2006) was 0.50 mSv (where 0.24 mSv was assessed as being due to nuclear industry discharges) The total dose from all

Indicator	Data Source	Current Data	Comparators	Trend
		<p>radionuclides in seafood are generally dropping or remaining static with the exception of certain of the heavier elements in lobsters</p> <ul style="list-style-type: none"> • Across a wide range of sampling locations and shellfish species, concentrations of lighter radionuclides were generally reduced from 2006 values 	<p>0.37 mSv</p>	<p>sources, including direct radiation, was assessed as being 0.44 mSv</p>
<p>Health related to nuclear installations</p>	<p>5</p>	<p>There has been, since 1956, a nuclear power station operating on the nearby Sellafield site, located approximately 2 km to the south-east. There are, therefore, historical data which can be analysed to correlate the incidence of disease reported around this site so that it can be compared to the average prevalence of the same disease in the British population as a whole. Such a comparison for childhood leukaemia, non-Hodgkin lymphoma and other malignant tumours was undertaken by the Committee on Medical Aspects of Radiation in the Environment (COMARE) in 2005. The results of this study for Sellafield are as below:</p> <ul style="list-style-type: none"> • Actual cases of childhood leukaemia and non-Hodgkin lymphoma between 1969 and 1993 in a 25km area around the plant were 25 • Actual cases of childhood solid 	<p>For comparison purposes, the figures derived using statistics for Britain as a whole are as follows:</p> <ul style="list-style-type: none"> • The expected number of cases of childhood leukaemia and non-Hodgkin lymphoma between 1969 and 1993 in a 25km area around the plant should have been 21.95 • The expected number of cases of childhood tumours between 1969 and 1993 in a 25km area around the plant should have been 35.96 <p>It was concluded, from the above statistics, that there was no evidence of excess numbers of these cases in the 25 km area which would include either primary exposure to radioactive discharges or secondary exposure from re-suspended material.</p>	

Indicator	Data Source	Current Data	Comparators	Trend
		tumours between 1969 and 1993 in a 25km area around the plant were 40		

Key to Data Sources

1	Office of National Statistics. http://neighbourhood.statistics.gov.uk/dissemination/home.do;jessionid=ac1f930c30d607c6170cbe3146ada704c9cac1978fc7?m=0&s=1236174480737&enc=1&bhcp=1&nsjs=true&nsck=true&nssvg=false&nswid=996
2	Department of Communities and Local Government. Indices of Deprivation 2007. http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/
3	NHS. Find Services. http://www.nhs.uk/servicedirectories/Pages/ServiceSearch.aspx
4	Food Standards Agency (2008). Radioactivity In Food and the Environment (RIFE) 2007. http://www.food.gov.uk/science/surveillance/radiosurv/rife13
5	Committee on Medical Aspects of Radiation in the Environment (COMARE) (2005). Tenth Report. The incidence of childhood cancer around nuclear installations in Great Britain. Health Protection Agency, June 2005. http://www.comare.org.uk/comare_docs.htm

Cultural Heritage

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Cultural Heritage				
Scheduled Monuments	1	There are 5 Scheduled Monuments within an approximate 5km distance of the site, the closest of which consists of two high cross shafts in St. Bridget's Churchyard which lies within 1km (750m). The others consist of Calder Abbey, an enclosure east of Winscales, Egremont Castle, and a stone circle.		
Conservation Areas	2	There are one Conservation Areas within 1km distance of the site: Beckermet which lies approximately 850m to the east.		

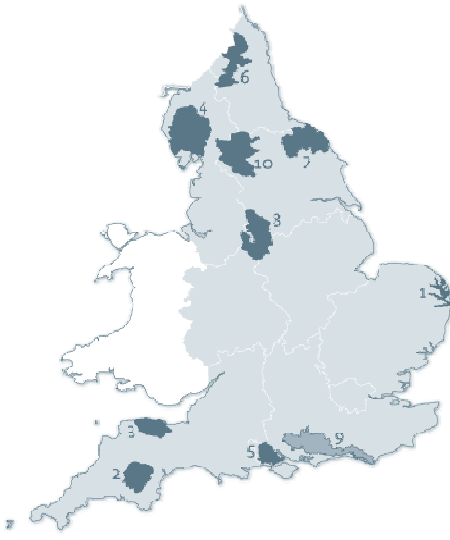
Indicator	Data Source	Current Data	Comparators	Trend
Listed Buildings	3	The closest Grade II Listed Building is Braystones Tower (also known as Diamond Jubilee Tower), located approximately 500m to the south. The nearest Grade I Listed Building is Egremont Castle, over 3km to the north.		
Archaeological sites	3	Prehistoric flints have been found within the site.		
Historic Landscape	4	Within the site there are field boundaries which are shown on late 19 th century mapping. Therefore, potential elements of the historic landscape lie within the site.		


Key to Data Sources

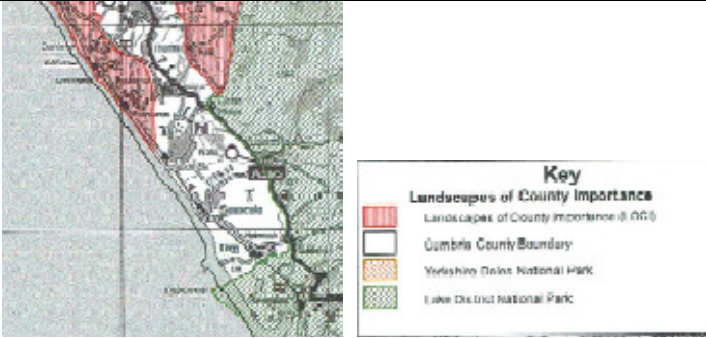
1	Magic Maps. Scheduled Monuments. http://www.magic.gov.uk
2	Copeland Borough Council. The Copeland Local Plan 2001 – 2016. http://www.copelandbc.gov.uk/ms/www/Local-Plan/Copeland-Local-Plan-2001-2016.htm
3	Heritage Gateway. Listed Buildings. http://www.heritagegateway.org.uk

Landscape

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Landscape				
National Character Area (NCA)	1	<p>The site is situated within the West Cumbria Coastal Plain NCA (7). Key Characteristics:</p> <ul style="list-style-type: none"> • Strong industrial history associated formerly with the mining of coal and iron ore and, more recently, the chemical industry, power generation and nuclear reprocessing. • Varied open coastline of mudflats, shingle and pebble beaches with localised sections of dunes, sandy beaches and sandstone cliffs. • Lowland river valleys with limited semi-natural ancient woodland, lowland raised mires and expansive estuarine landscapes with a range of intertidal habitats. • Gently undulating or flat improved pasture with hedgerows, wind-sheared trees and wire fences, occasional woodlands and copses, wetlands and herb-rich meadows. • Open agricultural landscapes that have extensive views to the higher fells in the east. • Extensive urban fringe areas within the coastal belt with large highly visible factories and manufacturing and processing plants, particularly near Workington, Whitehaven, Sellafield and Barrow. <p>Note: the site does not fall directly within an existing industrial context.</p> <p>Surrounding NCA's within the North West include:</p> <ul style="list-style-type: none"> • Cumbria High Fells • South Cumbria Low Fells 		

Indicator	Data Source	Current Data	Comparators	Trend
<p>National Parks</p>	<p>2</p>	<div style="text-align: center;">  </div> <p>Map showing National Parks Area 4 – The Lake District National Park 3.5km to the east The Lake District National Park may potentially be nominated as a World Heritage Site (Natural England) The Lake District National Park LCA will be relevant baseline at the EIA stage. Note –Associated Cumbria County Council Policy</p> <p>Policy E34: Areas and features of national and international conservation importance: Development and other land use changes in areas or features of national or international conservation importance, or within their setting (ie landscape around National Parks), and that are detrimental to their characteristics will not be permitted. Exceptions will only be made where: there is an over-riding need for development required to meet local infrastructure needs which cannot be located elsewhere and which is sited to minimize environmental impacts and meets high standards of design.</p>		

Indicator	Data Source	Current Data	Comparators	Trend
Heritage Coasts	3	 <p data-bbox="539 954 837 1015">Map of Heritage Coasts Area 32. St Bees Head</p>		
Relevant Local Designations	4	<p data-bbox="539 1050 1010 1078">Cumbria County Council Structure Plan</p> <p data-bbox="539 1114 1128 1142">Policy E36: Landscapes of County Importance</p> <p data-bbox="539 1177 1055 1206">Cumbria Landscapes of County Importance</p> <p data-bbox="539 1241 1989 1295">The site is set within a Landscape of County Importance (LOCI) as stated in Cumbria and Lake District Joint Structure Plan 2001 - 2016: Technical Paper 5: Landscape Character 2008.</p>		

Indicator	Data Source	Current Data	Comparators	Trend
		 <p data-bbox="546 683 2051 772">NB : Note on Status of Technical Paper 5 - This report does not constitute Structure Plan Policy at present (March 2009). The final version will replace two previous publications: Technical paper No 4 (1992) on the Assessment of County Landscapes and the Cumbria Landscapes Classification (1995).</p> <p data-bbox="546 804 896 829">Relevant District Policy Areas</p> <ul data-bbox="546 836 2051 1059" style="list-style-type: none"> • ENV 9 : Areas of Local Landscape Importance • ENV 14 : Development in the Coastal Zone • ENV 15 : Undeveloped Coast –Development will only be permitted on the undeveloped coast where: 1. the development requires a coastal location and there is no suitable site available within the developed coast. 2. the development maintains conserves or enhances the quality and character of the coastal zone. <p data-bbox="546 1091 1384 1117">The Cumbria LCA is also relevant baseline information at the EIA stage</p>		

Key to Data Sources

1	<p>Natural England. Landscape Character Areas – West Cumbria Coastal Plain NCA (7). http://www.naturalengland.org.uk/Images/jca7_tcm2-21069_tcm6-5165.pdf Natural England. North West National Character Area Map. http://www.naturalengland.org.uk/ourwork/landscape/englands/character/areas/northwest.aspx</p>
2	<p>Natural England. National Parks . http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nationalparks/default.aspx Natural England. Lake District . http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nationalparks/lakedistrict.aspx</p>
3	<p>Natural England. St Bees Head. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/heritagecoasts/stbeeshead.aspx Heritage Counts (2008). South West. http://www.english-heritage.org.uk/hc/server/show/nav.10741 Natural England. Heritage Coasts. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/heritagecoasts/default.aspx</p>
4	<p>Cumbria and Lake District Joint Structure Plan 2001 - 2016: Technical Paper 5: Landscape Character 2008 Plan showing areas at: http://www.cumbriacc.gov.uk/elibrary/Content/Internet/538/755/1599/2318/2323/38520131637.pdf Landscapes of County Importance : Plan showing this: http://www.cumbriacc.gov.uk/elibrary/Content/Internet/538/755/2789/39854145824.pdf Cumbria County Council. Landscape planning policies for Cumbria. http://www.cumbriacc.gov.uk/planning-environment/countryside/countryside-landscape/land/MC.asp</p>

Soils, Geology and Land Use

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Soils				
Agricultural Land Classification	1	<p>Please refer to the map. The Magic map produced by DEFRA in 2004 indicates the current agricultural grade of lands in England and Wales. These grades are Agricultural land classification Grades 1-5, non-agricultural and Urban.</p>		
Soils		<p>National Soils Research Institute (Report available)</p> <ul style="list-style-type: none"> • Wick 1 Soils • Deep well drained coarse loamy and sandy soils locally over gravel • Glaciofluvial or river terrace drift • Free draining permeable soils in unconsolidated sands or gravels with relatively high permeability and high storage capacity • Cereals and some horticultural crops in drier lowlands; stock rearing and dairying in Cumbria 		
Topic: Geology				
Geological SSSIs	3	There are no geological SSSI's within the local vicinity		
Geology and Land Quality	2	EnviroCheck Report (Report available)		

Indicator	Data Source	Current Data	Comparators	Trend
		<p>Geological Risks</p> <ul style="list-style-type: none"> • The local Geology is Alluvium, Till, Devensian, River Terrace Deposits (Undifferentiated), Glaciofluvial Deposits, Devensian underlain by Calder Sandstone Formation and St Bees Sandstone Formation. • No mineral abstraction has been recorded locally <p>Based on the information within the Envirocheck report the geological risks are;</p> <ul style="list-style-type: none"> • Moderate risk for the Potential for Compressible Ground Stability Hazards • Very low risk for the Potential for Landslide Ground Stability Hazards • Very low to low risk for the Potential for Running Sand Ground Stability Hazards • Very low risk for the Potential for Shrinking or Swelling Clay Ground Stability Hazards <p>Environmental Hazards</p> <p>Based on the Envirocheck report the main environmental Hazards are;</p> <ul style="list-style-type: none"> • Four Local Authority Landfills within 1 km of the site (the nearest one approximately 800 m north of the site) and four Registered Landfills within 1 km of the site (the nearest one approximately 790 m north of the site). • Five waste management facilities within 1 km of the site (the nearest one approximately 800 m north of the site). <p>Historic Land Use</p> <ul style="list-style-type: none"> • Historic maps ranging from the 1880's to current were studied. 		

Key to Data Sources

1	National Soils Research Institute Report 27374310 – (Report available on request). Purchased 9 th March 2009
2	Envirocheck Report 27374310_1_1 – (Report available on Request) Purchased 9 th March 2009
3	Natural England. Nature on the Map. http://www.natureonthemap.org.uk/map.aspx?m=nreserves

Water Quality and Resources

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Water				
Current State of the Waters in the North West River Basin District	1	<p>In the North West (NW) River Basin District (RBD), 20% of rivers (by length) meet the requirements for good ecological status or good ecological potential; the NW draft River Basin Management Plan (dRBMP) states that the target for 2015 will remain 20%. The majority of water bodies that fail do so because of pressures on fish. A greater number of groundwater bodies (44%) meet the requirements for good status. The NW RBD contains 18% of England's derelict land and a third of the poorest quality rivers in England and Wales. 25 Special Areas of Conservation (SCA) and 7 Special Protection Areas (SPA) with features that depend on water occur in the RBD.</p> <p>Of the 477 river water bodies in the RBD, 42% are candidate heavily modified or artificial water bodies. Of the 157 lakes and reservoirs, 40% are candidate heavily modified or artificial water bodies; 50% of these water bodies have not been assessed. Of the 12 identified transitional (estuary) water bodies, 9 are candidate heavily modified bodies, while for the 8 identified coastal waters, 6 are considered to be candidate artificial or candidate heavily modified bodies.</p> <p>There are 18 groundwater bodies in the North West RBD. The pressures and significant risks to these groundwater bodies have been identified as being from nutrient loading (nitrate and phosphate), hazardous substances (List 1 and chlorinated solvents), and abstraction and low flows (saline intrusion).</p> <p>Of the 18 groundwater bodies, 4 have been classified as good status, and the remaining 14 as poor. The groundwater body over which the site is located is the South Cumbria Lower Palaeozoic and Carboniferous aquifer. This is classified as good status for both quantity and quality. However, there are nutrient pressures on the water body.</p> <p>The site is located within the South West Lakes catchment which is nested in</p>		

Indicator	Data Source	Current Data	Comparators		Trend																														
		<p>the NW RBD. This is a mainly rural catchment, lying within the Lake District National Park. Much of the catchment consists of designated SAC and Sites of Special Scientific Interest (SSSI). Most water bodies support good populations of migratory salmon and other coarse fish. Otters and native crayfish are also present in good numbers.</p> <p>Catchment pressures come predominantly from diffuse pollution from rural sources. There are also localised pressures as a result of historic mining and isolated landfill sites. Non-native invasive species are an increasing problem. Currently 26% of surface water bodies in this catchment achieve either good status or good potential. The NW dRBMP has set a target of 32% of surface water bodies achieving good status or good potential 2015.</p> <p>The site lies close to the River Ehen, which flows parallel to the coastline before discharging to the sea from the same outlet as the River Calder. The Kirk Beck joins the River Ehen just to west of the village of Braystones.</p> <p>Local information for the area around the site from the Environment Agency (EA) web site relevant to Water Framework Directive (WFD) is summarised in the table below:</p>	<table border="1" data-bbox="535 959 1442 1307"> <thead> <tr> <th data-bbox="535 959 752 1051">Sector</th> <th colspan="2" data-bbox="752 959 1084 1051">Ecological / Quantitative (GW) Quality</th> <th colspan="2" data-bbox="1084 959 1442 1051">Chemical Quality</th> </tr> <tr> <th data-bbox="535 1051 752 1115"></th> <th data-bbox="752 1051 909 1115">Current</th> <th data-bbox="909 1051 1084 1115">Predicted 2015</th> <th data-bbox="1084 1051 1263 1115">Current</th> <th data-bbox="1263 1051 1442 1115">Predicted 2015</th> </tr> </thead> <tbody> <tr> <td data-bbox="535 1115 752 1179">River (River Ehen)</td> <td data-bbox="752 1115 909 1179">Good</td> <td data-bbox="909 1115 1084 1179">Good</td> <td data-bbox="1084 1115 1263 1179">High</td> <td data-bbox="1263 1115 1442 1179">Good</td> </tr> <tr> <td data-bbox="535 1179 752 1243">River (Kirk Beck)</td> <td data-bbox="752 1179 909 1243">Moderate</td> <td data-bbox="909 1179 1084 1243">Moderate</td> <td data-bbox="1084 1179 1263 1243">Not yet assessed</td> <td data-bbox="1263 1179 1442 1243">Not yet assessed</td> </tr> <tr> <td data-bbox="535 1243 752 1275">Groundwater</td> <td data-bbox="752 1243 909 1275">Good</td> <td data-bbox="909 1243 1084 1275">Good</td> <td data-bbox="1084 1243 1263 1275">Good</td> <td data-bbox="1263 1243 1442 1275">Good</td> </tr> <tr> <td data-bbox="535 1275 752 1307">Coastal</td> <td data-bbox="752 1275 909 1307">Moderate</td> <td data-bbox="909 1275 1084 1307">Moderate</td> <td data-bbox="1084 1275 1263 1307">Pass</td> <td data-bbox="1263 1275 1442 1307">Pass</td> </tr> </tbody> </table>		Sector	Ecological / Quantitative (GW) Quality		Chemical Quality			Current	Predicted 2015	Current	Predicted 2015	River (River Ehen)	Good	Good	High	Good	River (Kirk Beck)	Moderate	Moderate	Not yet assessed	Not yet assessed	Groundwater	Good	Good	Good	Good	Coastal	Moderate	Moderate	Pass	Pass	
Sector	Ecological / Quantitative (GW) Quality		Chemical Quality																																
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Groundwater	Good	Good	Good	Good																															
Coastal	Moderate	Moderate	Pass	Pass																															

Indicator	Data Source	Current Data	Comparators	Trend
		<p>The location of the existing site is close to the Cumbria coast water body which has a current ecological quality status of moderate. This is predicted to remain the same by 2015. The current chemical quality is Pass; which is predicted to remain at this status by 2015.</p> <p>There is no groundwater source protection zone located in the vicinity of the site.</p>		
<p>Current State of the Waters in the North West River Basin District</p>	<p>2</p>	<p>The site is located within the Derwent, West Cumbria and Duddon Catchment Abstraction Management Strategy (CAMS) area.</p> <p>There are a large number of sites designated for their environmental importance within this CAMS area. The River Ehen, West Water and the River Derwent and Bassenthwaite, are all designated as candidate Special Areas of Conservation (SAC), which are of European importance. The rivers are designated for several species and associated habitats, including lamprey, otter, salmon, pearl mussel and water crowfoot. West Water is designated because it provides a special low-nutrient habitat.</p> <p>This CAMS area is largely rural, but there are significant industrial water abstractors along the coast. Throughout the area small-scale water abstraction is important for a range of uses including agriculture, hydropower, campsites and private water supply.</p> <p>The largest water abstractions within this CAMS area are from lakes and reservoirs. Water from West Water is used at the nearby Sellafeld site. Public water supply for the area is mainly from Crummock Water and Ennerdale, along with a number of smaller reservoirs. Thirlmere is used to supply water locally and elsewhere in the North-West.</p> <p>The River Ehen Water Resource Management Unit (WRMU 6) is classified as “over licensed” as a target status to 2019, with a strategy to address this based on reducing full licensed quantities. Within the WRMU, Ennerdale Water and the River Ehen are water based designated SSSIs while the River</p>		

Indicator	Data Source	Current Data	Comparators	Trend
		<p>Ehen is also a water based SAC.</p> <p>The River Calder WRMU 7 is also classified as “over licensed” to 2013, with a target status of “no water available” by 2019, with a strategy to address this based on reducing full licensed quantities.</p> <p>The River Irt WRMU 8 is classified as “no water available” through to 2019. Wast Water is located within this WRMU and has both water related SSSI and SAC designations.</p> <p>The sites are also located on the West Cumbria Groundwater Management Unit (GWMU). This is classified as “water available” to 2013, moving to “no water available” by 2019.</p>		
<p>Water Demand and Availability Projected to 2035</p>	<p>3, 4,5, 6</p>	<p>The assessment of demand and supply occurs at the level of a Water Resource Zone (WRZ). A WRZ is defined by the EA as ‘the largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall’.</p> <p>The Government is proposing major house building programmes across the country. One of the reasons for needing more houses is that average occupancy in dwellings is reducing with changing social patterns. This has the potential to impact significantly on the demand for water as average per capita consumption is much higher in low occupancy dwellings than in homes with higher occupancy. UU recognise the need to review the WRMP in the light of any changes to projections for development of new homes or commercial properties.</p> <p>As commented earlier, the nearby Sellafeld site is supplied from Wast Water, but is also located within the West Cumbria WRZ. Initial supply demand balances for this zone through the planning period are presented in the table below. There is a small deficit in 2006/2007, but as a result of significant leakage reduction during 2007/2008, adequate supplies are currently</p>		<p>The Regional Spatial Strategy (RSS) for the North West of England sets out plans for growth in the NW RBD. This proposes an additional 411,000 homes in the period up to 2021 and associated employment, infrastructure and commercial development. Six “growth points” have been designated in the Region, with significant numbers of new housing planned, particularly in the areas surrounding Manchester and Liverpool.</p> <p>The forecast for the UU supply area shows household demand per capita consumption is expected to fall from 139 litres per head per day (l/h/d) in a normal year to 124 l/h/d in 2035, and 149 l/h/d to 138 l/h/d in a dry year.</p> <p>UU estimate the average sustained effect of household metering on demand for water is a reduction of 8.3% in a normal weather year.</p>

Indicator	Data Source	Current Data	Comparators				Trend																																							
		<p>available. A significant reduction in water availability for use is expected to occur in 2014/2015 as a result of sustainability reductions with planned changes in abstraction licences. The result of this is that supply-demand solutions will be required by 2014/2015 to maintain adequate water supply reliability in West Cumbria.</p> <table border="1" data-bbox="539 496 1391 740"> <thead> <tr> <th></th> <th>2006/07</th> <th>2009/10</th> <th>2014/15</th> <th>2019/20</th> <th>2024/25</th> <th>2034/35</th> </tr> </thead> <tbody> <tr> <td>West Cumbria Zone</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Water source yield</td> <td>58.9</td> <td>61.5</td> <td>52.6</td> <td>52.3</td> <td>52.2</td> <td>52.0</td> </tr> <tr> <td>Dry weather demand</td> <td>57.9</td> <td>54.5</td> <td>54.9</td> <td>54.7</td> <td>53.9</td> <td>51.5</td> </tr> <tr> <td>Target headroom</td> <td>1.4</td> <td>2.6</td> <td>1.9</td> <td>1.7</td> <td>1.3</td> <td>1.9</td> </tr> <tr> <td>Supply-demand balance</td> <td>-0.4 (deficit)</td> <td>4.3</td> <td>-4.1 (deficit)</td> <td>-4.1 (deficit)</td> <td>-3.1 (deficit)</td> <td>-1.4 (deficit)</td> </tr> </tbody> </table> <p>For the West Cumbria WRZ UU is proposing development of new groundwater source at South Egremont with a reliable dry weather yield of 5MI/d ready for supply by 2014/2015.</p> <p>The Environment Agency classifies the underlying bedrock for the site as a major aquifer, with the superficial deposits as a minor aquifer. However, there is no known use made of these water resources in the vicinity of the sites but springs on the beach are fed by groundwater and groundwater may also flow into the lower reaches of the rivers.</p> <p>There are no groundwater protection zones within the vicinity of the site.</p>		2006/07	2009/10	2014/15	2019/20	2024/25	2034/35	West Cumbria Zone							Water source yield	58.9	61.5	52.6	52.3	52.2	52.0	Dry weather demand	57.9	54.5	54.9	54.7	53.9	51.5	Target headroom	1.4	2.6	1.9	1.7	1.3	1.9	Supply-demand balance	-0.4 (deficit)	4.3	-4.1 (deficit)	-4.1 (deficit)	-3.1 (deficit)	-1.4 (deficit)		<p>Non-household consumption of potable water across the UU region has reduced substantially in recent decades. UU forecast that metered non-household water demand will fall by 37% between 2006/07 and 2034/35. The continuing decline in non-household water demand is as a result of continuing water efficiency measures and reduction in water-intensive industry in North West England, although there will be local variations.</p> <p>The number of households served by UU is expected to increase significantly from the 2006/07 level of 2.94 million to 3.57 million by 2034/35. This is in accordance with projections published in Draft Submitted RSS for North West England (2006).</p>
	2006/07	2009/10	2014/15	2019/20	2024/25	2034/35																																								
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Sensitive Areas – Urban Waste Water Directive	7	Urban Waste Water Directive Sensitive Areas bordering the site includes Seascale bathing waters, with the River Ehen classified as a Eutrophic Water downstream of Cleator.																																												

Indicator	Data Source	Current Data	Comparators	Trend
Coastal Processes and Sediments		<p>In terms of coastal hydrodynamic and morphology, the site at Braystones falls within the coastal cell from St Bees Head to Drigg and comprises of a multiple headland-bay system. This is a macro-tidal environment and tidal current action is the dominant process along this coastline. Tidal residual currents are directed from the west at St Bees Head and from the North West for the remainder of the coastline.</p> <p>The geometry of the Irish Sea and the dominant west to south-westerly direction of prevailing winds and waves tends to keep sediment close up against the coastline offering a measure of protection against erosion. There is a strong, wave driven, northward longshore drift along the coast north of St Bees Head towards the Solway Firth, which helps maintain the spit at Grune point.</p> <p>The site is characterised by a barrier beach backed by till cliffs. The Shoreline Management Plan (SMP) (Phase 1) describes the coastal processes active at the site as a projected progressive retreat of the coast at 0.2 to 0.5m/year until it is prevented by coastal defences associated with the Cumbria Coastal Railway. Such a situation would result in gradual loss of much of the fine beach material and steepening of the beach. It is further expected that storm events may then result in increased draw-down of material, resulting in increased vulnerability of the existing coastline to gradual erosion. In terms of coastline movement, the section of coastline is described at present by the SMP as experiencing 'No Movement'.</p>		

Key to Data Sources

1	Environment Agency (Dec 2008, corrected Feb 2009) Water for Life and Livelihoods: A consultation on the Draft River Basin Management Plan: North West River Basin District [online] available: http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/northwest/Intro.aspx ¹⁴
2	The Derwent, West Cumbria and Duddon Catchment Abstraction Management Strategy, April 2007: http://www.environment-agency.gov.uk/research/planning/102274.aspx
3	United Utilities, Draft Water Resources Management Plan, April 2008 [online] available: http://www.unitedutilities.com/Draft_Water_Resources_Management_Plan_-_Main_Report.pdf [accessed March 2009] ¹⁵
4	The North West Plan: Submitted Draft Regional Spatial Strategy for the North West of England, January 2006 ¹⁶ : http://www.gos.gov.uk/497468/images/267947/Draft_RSS.pdf

¹⁴ The data used in this assessment are taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time of writing. Draft plans were presented to the Government for approval in September 2009 and were subsequently published in December 2009.

¹⁵ The data used in this assessment are taken from the Draft Water Resources Management Plan, which was the most up to date plan available at the time of writing. Subsequently, on 3rd August 2009, the Secretary of State for Environment, Food and Rural Affairs gave UU permission to prepare and publish its final plan

5	Regional Spatial Strategy for the North West of England September 2008 ¹⁷ : http://www.gos.gov.uk/gonw/Planning/RegionalPlanning/
6	Sellafield Ltd (2009). Land Quality Management – Geology and Hydrogeology http://www.sellafieldsites.com/land/pages/geology_hydrogeology.html
7	DEFRA (March 2002). Urban Waste Water Treatment Directive Sensitive Area. http://webarchive.nationalarchives.gov.uk/20080305115859/http://www.defra.gov.uk/environment/water/quality/uwwtd/sensarea/pdf/sensarea-nwest.pdf

¹⁶Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

¹⁷Data from the Regional Spatial Strategies (RSS) and other regional plans and strategies were used to inform the AoS reports published in November 2009. On 6 July 2010, the Secretary of State for Communities and Local Government, announced the revocation of Regional Strategies and the other documents noted with immediate effect. However, the RSS and other revoked regional documents remain a useful source of background data on regional sustainability issues, so references to these documents have been retained in later revisions of the AoS. The strategies and policies set out in the revoked regional documents may in future be taken forward by other means in local or strategic planning and applicants will need to consider this in developing their future plans.

Flood Risk

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Flood Risk				
Flood Risk	1, 2	<p>The site is in Flood Zone 1 'low probability', but is bounded along the coastline by Flood Zone 3 'high probability' and to the east by the River Ehen, also Flood Zone 3, as indicated on the Environment Agency Floodmap.</p> <p>Localised defences are present, protecting the Cumbrian West Coast railway.</p> <p>According to the SFRA the area is susceptible to tidal surges.</p>		<p>Flood risk is expected to increase in the UK due to the predicted changes in climate leading to more intense rainfall events, wetter winters, rising sea levels and coastal erosion. Scenarios of climate change for the UK were published by the United Kingdom Climate Impacts Programme (UKCIP) in 1998 and 2002.</p> <p>'The Climate of the UK and Recent Trends 2008' by the Met Office, provided the following general comments in relation to trends in climate change and how this might affect flood risk:</p> <ul style="list-style-type: none"> • Global sea level rise has accelerated between mid 19th century and mid 20th century and is now about 3mm per year • All regions in the UK have experienced an increase over the past 45 years in the contribution to winter rainfall from heavy precipitation events; in summer all regions except North East England and North Scotland show decreases • Sea level rise around the UK rose by about 1mm/per year in the 20th century, corrected for land movement. The rate for the 1990s and 2000s has been higher than this <p>Most recently in June 2009, UKCIP launched the latest UK Climate Change Predictions 2009 (UKCP09). These give information about climate</p>

Indicator	Data Source	Current Data	Comparators	Trend
				<p>change but not directly about flood risk. The key findings on climate change confirm the trends highlighted in the 2008 report and suggest:</p> <ul style="list-style-type: none"> • All areas of the UK get warmer, and the warming is greater in summer than in winter. • There is little change in the amount of precipitation that falls annually, but it is likely that more of it will fall in the winter, with drier summers for much of the UK. • Sea levels rise and the rise is greater in the south of the UK than in the north.

Key to Data Sources

1	Environment Agency (2009) What's in your backyard? http://maps.environment-agency.gov.uk/wiyby/wiybyController Accessed 11 th March 2009
2	Jacobs (August 2007) Strategic Flood Risk Assessment http://www.copeland.gov.uk/ms/www/Local-Plan/PDF/flood-assessment/Copeland-SFRA-Final.pdf

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