

# **Appendices:**

## **Appraisal of Sustainability**

### **Site Report for Oldbury**

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

## **Appraisal of Sustainability of the 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 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.energygpsconsultation.decc.gov.uk>

This document is the Appendices to the Appraisal of Sustainability Site Report for Oldbury. 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 Appraisal of Sustainability 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
<b>Air Quality</b>	
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?
<b>Biodiversity and Ecosystem Services</b>	
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?
<b>Climate Change</b>	
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)?

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

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
23. internationally and nationally important features of the historic environment. To avoid adverse impacts on the setting and quality of built heritage, archaeology and historic landscapes	Will it adversely affect other historic sites of known value? Will it adversely affect landscapes of historic importance?
<b>Landscape</b>	
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 National Scenic Area? 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?
<b>Soils, Geology and Land Use</b>	
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?
<b>Water: Hydrology and Geomorphology</b>	
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?
<b>Water: Water Quality (including surface, coastal and marine)</b>	
16. To avoid adverse impacts on surface	Will it cause deterioration in surface water quality as a result of accidental pollution, for example spillages,

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
<p>water quality (including coastal and marine water quality) and assist achievement of Water Framework Directive objectives</p>	<p>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?                      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?</p>
<p><b>Water: Water Supply and Demand</b></p>	
<p>17. To avoid adverse impacts on the supply of water resources</p>	<p>Will it adversely affect water supply as a result of abstraction?                      Will it increase demand for water?</p>
<p><b>Water: Groundwater Quality and Flow</b></p>	
<p>18. To avoid adverse impacts on groundwater quality, distribution and flow and assist achievement of Water Framework Directive objectives</p>	<p>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>
<p><b>Flood Risk</b></p>	
<p>14. To avoid increased flood risk (including coastal flood risk) and seek to reduce risks where possible</p>	<p>Will it result in demand for higher defence standards that will impact on coastal processes?</p>

## 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.



<b>Air Quality</b>	
<b>AoS Objective:</b>	12. To avoid adverse impacts on air quality
<b>Guide questions:</b>	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?
<b>Potential Receptors:</b>	
<ul style="list-style-type: none"> <li>▪ Local populations and wider regional population (human health)</li> <li>▪ Sensitive habitats, including Severn Estuary RAMSAR site, SPA, SAC and SSSI; River Wye SAC and SSSI; Wye Valley and Forest of Dean Bat Sites SAC; Wye Valley Woodlands SAC; and 9 No. additional SSSIs (Lower Wye Gorge; Tytherington Quarry; Poor’s Allotment; Caerwood and Ashberry Goose House; Aust Cliff; Brinkmarsh Quarry; Shorn Cliff and Caswell Woods; Pennsylvania Fields, Sedbury; and Buckover Road Cutting.</li> <li>▪</li> </ul>	
<b>Potential Significant Effects and Mitigation Possibilities:</b>	
<b>International/ National/ Transboundary</b>	
<ol style="list-style-type: none"> <li>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 (possibly similar in nature to those the existing Oldbury nuclear facility currently operate under) and management techniques during construction, operation and decommissioning stages.</li> <li>2. However there is potential for release of radioactive emissions, planned and accidental, during the operation and decommissioning of a nuclear power station and waste storage on the site. This has potentially negative significant consequences for a wide demographic area, including conurbations downwind along the Severn Estuary (such as Chepstow and Bristol) and Gloucester due to prevailing wind directions (predominately southwest with high frequency north-easterly winds). 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 existing Oldbury-upon-Severn nuclear facility (defueling is expected to commence during 2009).</li> <li>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.</li> </ol>	
<b>Regional/ Local</b>	

## Air Quality

4. Air quality in the South West is generally good with low levels of sulphur, nitrogen dioxide and particulates in comparison to the rest of England. However, pockets of poor air quality exist in the region, especially within large urban industrial areas such as Bristol. No Air Quality Management Areas (AQMAs) are located within the vicinity of the site. The effect on air quality from the construction, operation and decommissioning of the nuclear power station is not likely to be significant, provided construction and operation is in accordance with regulatory/consenting regimes and current good practice.
  
5. 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. This is discussed in further detail in Section 9 of the AoS report.
  
6. 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 activities.
  
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 Radioactive Substances Act 1993. This will be specific to the reactor type being used, alongside the siting and sensitivity of the receiving environment.
  
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.

### Summary of Significant Strategic Effects:

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

#### Significant Effects

- 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

#### Mitigation and Monitoring Possibilities

- 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.

### Air Quality

effect on air quality, including an increased risk of transboundary / international 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.

## 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:

Severn Estuary SAC, SPA/Ramsar sites and SSSIs (Severn Estuary SSSI and Upper Severn Estuary SSSI) – adjacent to the nominated site.

River Wye SAC/SSSI – the river mouth of the Wye is located south of the nominated site.

Priority habitats and species – including intertidal mudflats, estuarine rocky habitats and saltmarsh, migratory fish (including internationally and nationally important populations), wintering and migratory wading birds (including internationally and nationally important populations) and Otter. A number of other priority habitats and species may be affected for which further detailed survey information may be required to inform an Environmental Statement (ES) at the project level.

### Potential Significant Effects and Mitigation Possibilities:

**International/ National/ Transboundary**

1. **Disturbance (noise, light and visual)** effects during construction (scheduled for up to 5-6 years) could have an adverse impact on the populations of wading birds and wildfowl associated with the Severn Estuary cSAC/SPA/Ramsar/SSSI designated sites. Visual and noise disturbance could arise

## Biodiversity and Ecosystems

from general construction site activities, the increase in the number of workers on site, including at any temporary workers' accommodation on site, and their work adjacent to and within the designated sites, from the presence of construction plant and equipment, construction traffic, and site lighting. The Severn Estuary is of international importance for wintering and passage wading birds, with total winter populations averaging about 44,000 birds. Numbers can be considerably higher during severe winters, owing to its mild climate; the Severn supports wader populations that move in from the colder coasts of Britain. The SSSI supports a high proportion of the estuary's internationally important Curlew *Numenius arquata* and Redshank *Tringa tetanus* populations, and a large percentage of its nationally important Ringed Plover *Charadrius hiaticula* and Grey Plover *Pluvialis squatarola* populations. Other waders which occur in significant numbers within the SSSIs are Common Snipe *Gallinago gallinago*, Knot *Calidris canutus*, Whimbrel *Numenius phaeopus* and Turnstone *Arenaria interpres*. The SSSIs are internationally important for Dunlin *Calidris alpina* and supports about 7.5% of the British wintering population of this species. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of Dunlin in Britain. In late winter and early spring the SSSI supports nationally important numbers of Shelduck *Tadorna tadorna*, following the partial dispersal from their moulting grounds in Bridgwater Bay<sup>1</sup>. There is the potential for disturbance effects on important bird species utilising designated areas to be affected by construction of the site which could result in the birds avoiding their preferred areas of for feeding or roosting, being displaced, and this may impact on their chances of survival. The nominator will need to assess the potential for disturbance effects from construction on birds in the designated areas and define measures to avoid or minimize such effects.

2. **Direct loss and fragmentation of priority habitats** and habitats used by priority species, during construction of new power station buildings, from earthworks and excavations, and infrastructure, including new roads and potential railway lines, on terrestrial and estuarine priority habitats. The construction of infrastructure to accommodate a new plant which could include cooling water culverts, a new sea wall, and a potential marine landing facility, may result in the encroachment of development onto the foreshore resulting in the loss of both marine (wave-cut platforms and sub-tidal habitat) and terrestrial habitats within the Severn Estuary SAC/SPA/Ramsar sites (and component SSSIs). New transmission line towers may be proposed which traverse the site and require potential loss of priority habitats for tower bases and clearance of hedgerows for the pylon corridor. The permanent presence of site buildings and infrastructure, including roads and lighting, will lead to longer-term loss, fragmentation and disturbance of habitats which could comprise severance of wildlife corridors, such as any commuting and foraging routes used by bats through the site. The potential for priority habitats and areas used by priority species to be retained within the site, and new habitats to be created to mitigate for impacts, will need to be considered by the nominator in the site design and layout, routeing of roads and transmission lines and other infrastructure, and measures defined in the nominator's proposals and EIA to avoid or minimise such losses. Further site level surveys would be required to determine a baseline for the prediction of the effects of developing the site on any protected species within the development footprint in order to implement suitable mitigation measures.
3. The **abstraction of water for cooling purposes** can lead to incidental mortality of fish and other aquatic species. Fish, larvae and eggs can be sucked into condenser circuits and subject to heat before being returned to the sea<sup>2</sup>. The Severn Estuary and River Wye areas are designated for their internationally/nationally important migratory fish populations and large numbers of waders and wildfowl which may be particularly vulnerable to

<sup>1</sup> [http://www.sssi.naturalengland.org.uk/Special/sssi/sssi\\_details.cfm?sssi\\_id=1001145](http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1001145)

<sup>2</sup> BERR (July 2008) Applying the Strategic Siting Assessment Criteria: a study of the potential environmental and sustainability effects.

## Biodiversity and Ecosystems

abstraction/discharge (see below) processes. Seven species of migratory fish move through the Estuary between the sea and rivers. There are particularly large numbers of Atlantic Salmon *Salmo salar* and Common Eel *Anguilla anguilla*. The other species are Allis Shad, the nationally rare Twaite Shad *Alosa fallax*, the Sea Trout *Salmo trutta*, Sea Lamprey *Petromyzon marinus* and the Lampern or River Lamprey *Lampetra fluviatilis*. It should be noted that although BERR (2008) states that new technologies are designed to eliminate the above impacts, BE's EIA Scoping Report states that the potential to incorporate fish protection measures may be limited at the site. Water is currently abstracted from the estuary and bay for the existing Hinkley Point 'B' power station for its remaining operational lifetime, and the impact of the current abstraction is not known. Further studies will be required by the nominator to assess the effects on aquatic ecology from abstraction for the site, especially in relation to migratory fish, and to identify a suitable intake/system design which avoids significant ecological effects within the SAC/SPA/Ramsar site (and component SSSIs).

4. **Discharge of the heated water** (up to 10°C warmer) used in the power station's cooling system into the Severn Estuary may result in changes to aquatic ecology in areas affected by higher temperatures, which may be negative, or positive for certain species. Both changes to water quality and of water temperature can impact species composition and encourage excessive algal growth, which could result in wider impacts on migratory fish and otters within the Severn Estuary and River Wye internationally designated areas. Discharges of heated water from a new power station would be released in addition to that from the existing Hinkley Point 'B' power station for its remaining operational lifetime and potentially an additional new power station facility at Hinkley; the impact of cumulative discharges is not known. Further studies will be required to understand fully the extent and likely significance of effects on aquatic ecology of proposals to discharge heated water, especially in relation to wading birds and migratory fish populations within the zone of influence of the site.
5. **Routine releases of radioactive discharges** to water during operation is envisaged as being, for all reactor designs being considered through the GDA process, within authorised limits that will be set by the relevant agency under the Radioactive Substances Act 1993. However, aquatic discharges from a new power station would be released in addition to those currently discharged to the area under authorisation from the existing Hinkley Point 'B' power station for its remaining operational lifetime. The Severn Estuary and its inter-tidal mudflats, sandflat and saltmarshes, are particularly vulnerable to contamination with toxic compounds, including through direct contact or accumulation of toxins and radionuclides through the food chain, including in waterfowl and migratory fish species associated with the internationally protected Severn Estuary and River Wye. Further studies will be required to understand fully the extent and likely significance of effects on aquatic ecology of proposals for additional radioactive discharges from the site.
6. There is a 'very small risk' of accidents or incidents at any nuclear power station site leading to unplanned release of radiation into the environment, during operation, including from interim radioactive waste storage, during decommissioning activities, and during transport of radioactive waste for final disposal. There is also the potential for accidental discharges of pollutants by leaks or spillages from the water treatment plants. Such releases could adversely affect terrestrial and aquatic flora and fauna associated with the Severn Estuary SAC/SPA/Ramsar site (and component SSSIs) and River Wye SAC/SSSI such is the diffuse and mobile nature of these ecosystems. However, the operation of nuclear power stations, including waste storage, and decommissioning activities and the transport of radioactive waste, are subject to strict regulatory controls which aim to minimise such risks, and the likelihood of any effect is considered low. The designated sites and local ecological systems are currently subject to these risks from the existing Oldbury power station. Further studies are likely to be required to assess the risks and potential effects of the occurrence of such events on biodiversity.

## Biodiversity and Ecosystems

7. There is potential for local changes in the air quality from increased development/traffic growth, and emissions (nitrogen oxides, sulphur dioxide) arising from construction/decommissioning and operational activity (argon-41, krypton-85 and tritium). An increase in airborne pollutants can lead to nutrient loading that can impact through the ecosystem to effect birds and migratory fish and within the Severn Estuary and River Wye Natura 2000 sites. Further background environmental condition information and modelling is likely in order to predict potential impacts of local changes in air quality and the effects of accidental release of radioactive emissions over a larger scale/time frame.
8. The Severn Estuary area is a focus for a number of potential high profile development projects involving both nuclear and renewable energy options, the cumulative effects of which are likely to be significant to the overall impacts on biodiversity, particularly the Severn Tidal Power project.

### Regional/ Local

9. Site construction may lead to direct loss of habitats and disturbance of associated species, with severance of wildlife corridors. These losses may adversely affect ecological networks within the locality for mobile protected species reliant on wildlife corridors and connectivity within the landscape. Further site level surveys would be required to determine impacts on habitats and protected species within the development footprint in order to implement suitable mitigation measures.
10. The pollution of watercourses with sediment, oil, fuel, cement or other substances used during construction, from general construction site activities, earthworks and excavations, site drainage works and use of vehicles, could affect habitats and species in the local network of watercourses due to the movement of pollutants through tidal movements. Contamination by synthetic and non-synthetic compounds is potentially an issue for the Severn Estuary mudflats, sandflats and saltmarshes, as toxins can bind to sediments, affecting supporting species. Changes in organic and nutrient loading can also change species composition of plants on the saltmarsh. Mitigating methods will need to be adopted during all phases of the sites' lifecycle to reduce pollution contamination, with regular water monitoring in place.
11. Construction and the proposed new site boundaries are directly adjacent to the cSAC, with potential for coastal squeeze which prevents the managed retreat of intertidal habitats necessary to support its favourable condition. All supporting habitats for SPA designation are sensitive to removal by land reclamation and construction activity. Consideration should be given to site layout and land take.

### Summary of Significant Effects:

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

### Significant Effects

- Noise, visual and light disturbance during construction to important bird populations associated with the Severn Estuary SAC/SPA/Ramsar (and component SSSIs).
- Direct loss and fragmentation of priority terrestrial habitats and disturbance to species during

### Mitigation and Monitoring Possibilities

- Minimise need for encroachment of construction into sensitive areas through site design.
- Construction environmental management plan to minimise disturbance, for example through timing,

## Biodiversity and Ecosystems

construction of power station and infrastructure including transmission lines/towers. Permanent habitat loss and severance of wildlife corridors through presence of buildings, roads, transmission lines and lighting.

- Impact of cooling water abstraction on fish species, qualifying features of Severn Estuary SAC and River Wye SAC (and component SSSIs).
- Impact of discharge of heated waters on aquatic ecology of Severn Estuary SAC/SPA/Ramsar and River Wye SAC (including component SSSIs).
- Routine discharges of radioactive liquids during operation, potential for accumulation in aquatic environment and harm to species.
- Small risk of accidental discharges of radioactive materials to aquatic environment.
- Pollution of water courses from construction and operational activities, with impacts on Severn Estuary and associated species.
- Construction of nominated site close to coast leading to coastal squeeze, preventing the managed retreat of intertidal habitats associated with the Severn Estuary SAC (and component SSSIs).

visual/noise screening.

- Avoid or minimise losses through site layout design. Habitat creation to replace lost habitats and maintain connectivity of wildlife corridors around site. Ecological mitigation and management plan, adapted for the site.
- Incorporation of fish protection measures within cooling water intake/system design.
- Further studies necessary to determine impact.
- Further studies necessary to determine impact.
- Avoidance through safe operation and decommissioning and waste storage and transfer.
- Further studies necessary to determine risks.
- Avoidance through safety measures and water quality monitoring.
- Minimise need for encroachment of construction into sensitive areas through site design and further studies to determine impact.
- Avoidance through safety measures and water quality monitoring. Further studies to determine significance.
- Further studies necessary to determine impact.



## 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. The effects of changes in greenhouse gas emissions as a result of the proposed development have national and international effects, particularly when combined with a wider nuclear programme. The benefits of the low carbon emissions from the operation of nuclear power stations due to this technology and that are 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. [1]
2. During the operational phase, the carbon footprint is similar to those of windpowered stations with equivalent output but with significantly less land or area coverage. This aspect is further amplified due to the security boundary and the protection it offers from tourism, agriculture or transport intrusion. [2]
3. This consideration is independent of any life-cycle (embodied) carbon emission analysis, which is currently outside the scope of this study.
4. 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) .

## Climate Change

5. Construction and decommission activities will have both direct and indirect greenhouse gas emissions associated with them regardless of the location of such 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.
6. Other global, generic issues relating to vulnerability of nuclear power plants to climatic impacts such as sea level rise, most intense weather events and flooding are covered in other topics unless regionally or locally significant.

### Regional/Local

7. The provision of a nuclear power station for energy generation at the site will make a positive contribution to the objective of the Gloucestershire County Council 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 no nuclear power facility option in the region. [3]
8. 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. There is potential for sea transport to be used for major items of plant and equipment, however, the location of the nearest port needs to be considered to ensure the best scenario not entailing excessive carbon dioxide emission from transportation. Another option for transportation to consider will be the use of the current rail infrastructure in place, it should be noted that the nearest rail station is in between the town of Morton and Tytherington. 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. [3 + 4]
9. Other considerations include the possibility of the need to expand road or rail transport in order to accommodate the construction technical and upgrade demands in a rural setting. The net cross-cutting impacts of emissions on biodiversity, land, water, population and health should be considered- opportunities of applying better transport, material and application design aspects may seek to minimise these impacts.[5]
10. 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.
11. A reduction of Carbon dioxide emissions from South in South Gloucestershire has been observed from 2005 to 2006.[6]

Climate Change						
<b>Summary of Significant Strategic Effects:</b>			Timescale	C	O	D
			Significance	-	++	-?
			Likelihood	M	H	?
<b>Significant Effects</b> <ul style="list-style-type: none"> <li>The reductions in greenhouse gas emissions due to the operation of nuclear power plants compared to alternative sources of energy will have positive long term effects during the operational stage and longer –term. The cumulative benefits of a nuclear program for climate change are further discussed in the main AoS report.</li> <li>Locating a nuclear power station on the site could have a positive multiplier effect on the further investment and implementation of other renewable (low carbon) energy sources in the region.</li> <li>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 station. This is discussed in the main AoS Report.</li> <li>The operational phase of the power station is likely to have far less carbon footprint compared to those of fossil-fuel powered stations providing similar power output.</li> </ul>			<b>Mitigation and Monitoring Possibilities</b> Appropriate sea and coastal defence measures along with flood alleviation designs should seriously be considered. <ul style="list-style-type: none"> <li>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.</li> <li>The greenhouse gas emissions arising from construction and operation should be monitored to inform carbon reduction through the lifetime of the project.</li> </ul>			

1	A White Paper on Nuclear Power: <a href="http://www.berr.gov.uk/files/file43006.pdf">http://www.berr.gov.uk/files/file43006.pdf</a>
2	Carbon Footprint of Electricity Generation, Parliamentary Office of Science and Technology, October 2006, Number 268 <a href="http://www.parliament.uk/documents/upload/postpn268.pdf">http://www.parliament.uk/documents/upload/postpn268.pdf</a>
3	Gloucestershire County Council <a href="http://www.gloucestershire.gov.uk/index.cfm?articleid=1133">http://www.gloucestershire.gov.uk/index.cfm?articleid=1133</a>
4	Strategy for Sustainable Construction <a href="http://www.berr.gov.uk/files/file46535.pdf">http://www.berr.gov.uk/files/file46535.pdf</a>
5	Transport Economic Evidence Study, SDG for EEDA, September 2009 <a href="http://www.eeda.org.uk/files/TEES_Final_Report.pdf">http://www.eeda.org.uk/files/TEES_Final_Report.pdf</a>
6	South Gloucestershire Core Strategy – Issues and Options Consultation <a href="https://consultations.southglos.gov.uk/inovem/consult.ti/CSissuesandoptions/viewCompoundDoc?docid=109780&amp;sessionid=&amp;voteid=&amp;partId=109812">https://consultations.southglos.gov.uk/inovem/consult.ti/CSissuesandoptions/viewCompoundDoc?docid=109780&amp;sessionid=&amp;voteid=&amp;partId=109812</a>

<b>Communities: Population, Employment and Viability</b>	
<b>AoS Objective:</b>	
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	
<b>Guide questions:</b>	
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?	
<b>Potential Receptors:</b>	
Local and regional resident workforce	
Local and regional population	
<b>Potential Significant Effects and Mitigation Possibilities:</b>	
<b>International/ National/ Transboundary</b>	
No significant effects identified at this scale.	
<b>Regional/ Local</b>	
<ol style="list-style-type: none"> <li>1. Short-medium term positive effects through creating new jobs for local and regional population. The quality and quantity of employment during the construction stages (approx 5-6 years) of the reactor will differ to the operational stage (approx 30 years), 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 min 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.</li> <li>2. The existing facility at the site is a significant local employer, employing approximately 480 full-time staff<sup>3</sup>. A new power station may assist in offsetting job-losses from the decommissioning of the existing power station at the site (NB: Oldbury was due to cease the production of electricity at the end of 2008, with defuelling taking place 2009-2010) -however it is noted the time difference between decommissioning and construction of any new reactor may require employees to seek employment elsewhere.</li> <li>3. Positive effects through the provision of training, education and upskilling for employees and contractors in the region.</li> <li>4. Positive multiplier effects (for both nuclear-related industry and wider industry as a result of increased demand from an incoming population). Of</li> </ol>	

<sup>3</sup> <http://www.magnoxnorthsites.com/about-us/our-sites/oldbury>

### Communities: Population, Employment and Viability

greater significance at the local level, but may be positive cumulative effect at regional level when considered with other low carbon energy proposals (for example Hinkley Point Nuclear Power Station, Severn Tidal Barrage).

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 region. Problems related to sourcing construction labour have featured in debate relating to the South West Regional spatial Strategy.<sup>4</sup>
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 25 mile 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.
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.

#### Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	+ ?	+?	0
Likelihood	H	H	M

#### Significant Effects

- 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

- 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.

<sup>4</sup> South-West Regional Assembly 2006. South-West Draft Regional Spatial Strategy.

## Communities: Supporting Infrastructure

**AoS Objective:**

8. to avoid adverse impacts on the function and efficiency of the strategic transport infrastructure

9. to avoid disruption to basic services and infrastructure

**Guide questions:**

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)?

### Potential Receptors:

- Local and regional population
- Existing transportation and service infrastructure
- Existing waste management infrastructure

### Potential Significant Effects and Mitigation Possibilities:

**International/ National/ Transboundary**

1. Potential for negative effects on national transport network through congestion to M5 motorway during construction, operation and decommissioning stages. Junction 14 (Falfield) of the M5 motorway is *circa* 8 km east of the site as the crow flies but, with the only suitable HGV route requiring access to the A38 east of Thornbury, the road distance is between 12 and 14 km. M5 Junction 14 is known to have congestion problems in peak hours, although it functions adequately at other times. Currently, the M5, north of the Almondsbury Interchange with the M4, experiences between 0-90% observed daily stress, which is anticipated to rise to 90-100% by 2016. However, links on the M4 and M5 motorways, east and south of Almondsbury, currently experience stress levels of 110-130%, with 2016 forecast levels of 130-150% on these links. By 2026, forecast daily stress on the M5 between Junction 9 (Tewkesbury) and Junction 15 (Almondsbury) rises to 100-110%, whilst the M4 and M5 east and south of Junction 15 are generally forecast to have levels exceeding 130% with the immediately adjacent links having stress levels exceeding 150%.<sup>5</sup>
2. Further information is required to determine the effect on the M5, including details on construction workforce, timeframes and volume of materials to be transported. However, it is clear that the capacity of the M4/M5, particularly around the Almondsbury Junction, is likely to be under significant strain during the lifetime of this project, mainly due to future planned development in and around Bristol.
3. Mitigation measures can be implemented to minimise effects on the M5 Motorway through appropriate planning. This may include physical improvements, carrying of large loads outside of peak period, construction transport management plans, and green travel plans for the construction and operational workforces to encourage sustainable travel.
4. Rail should also be considered as an alternative option, particularly for the transport of construction materials, using the existing freight line to

<sup>5</sup> Highways Agency (2008). Regional Network Report for South West

### Communities: Supporting Infrastructure

Tytherington Quarry. This may have impacts on existing freight movements on this line, although such effects can be mitigated through appropriate planning and management plans.

5. Impacts of the transportation of Nuclear Waste are unknown until the location of a long-term waste geological depository facility is known. This is being considered as part of the Government's programme for Managing Radioactive Waste Safely.
6. Impacts of the storage and disposal of nuclear waste are dealt with separately in the main AoS Report.

#### Regional/ Local

7. Negative effects identified for transportation network. Nature and significance of effects depend on mode of transport, and further details on construction workforce, timeframes and volume of materials to be transported.
8. Access by road is limited to a single connection but it is of reasonable standard having been upgraded when the existing power station was built. Key roads providing current access to the site (the M5 and A38) already suffer some peak period and seasonal (summer) congestion, but not to a significant extent.
9. Some negative local transportation effects likely for Thornbury, however further transportation studies are required to determine appropriate mitigation measures, including any physical improvements to the road network.
10. Access to the rail network may be available from Tytherington Quarry, approximately 8-9 km from the site and currently served by a single track freight line. However, further transport to the site would still require transport on local roads. The use of shuttle buses operating possibly between Bristol Parkway station and the site may alleviate some pressure on the local road network.
11. Access by water would only be possible if some temporary wharf facility could be constructed at the site itself. This may compromise the existing lagoon at the site.
12. 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- however effects are unlikely to be significant. The preparation of a Construction waste management plan will assist in minimising impacts on existing waste facilities.
13. Operational waste (non-radiological) will have impacts upon the capacity of existing waste management services, however it may be possible to extend arrangements for the existing nuclear facility and the implementation of an operational waste management plan would help to minimise any impacts.
14. Any influx of a new temporary workforce will place pressure on existing infrastructure, social and community services, as will increased population in local towns and villages in the longer term. This may require augmentation of existing services (including electricity and wastewater infrastructure) to cope with demand, however is not considered to have a significant effect. Further details regarding the sourcing of the workforce will be required to consider this at the detailed planning stage.
15. The construction and operation of a second nuclear power station at the site is likely to require additional services/ connection to existing services (including electric, water and wastewater), however the location of an existing plant at the site will limit the amount of new infrastructure required. This is not considered to be a significant effect.
16. The development of a nuclear power station at Oldbury may require new power lines to be built, or existing lines to be upgraded, to connect the facility with the National Grid. The potential impact of new or upgraded power lines will be considered in a separate Networks National Policy Statement (NPS).

<b>Communities: Supporting Infrastructure</b>						
<b>Summary of Significant Strategic Effects:</b>			Timescale	C	O	D
			Significance	-?	-?	-?
			Likelihood	M	M	M
<p><b>Significant Effects</b></p> <ul style="list-style-type: none"> <li>• Potential for significant effects on national road infrastructure through increased congestion/ disruption of traffic on the M5 motorway and at junction 14 linking to the A38. In isolation, this is not considered likely to be significant; however the cumulative effect of development in the region, including planned development in and around Bristol, may lead to increased congestion during construction, operation and decommissioning stages.</li> <li>• Potential for effects on strategic road network through carrying of large loads during construction – however this can be mitigated.</li> </ul>	<p><b>Mitigation and Monitoring Possibilities</b></p> <ul style="list-style-type: none"> <li>▪ Further studies will be required to assess in detail the effects on the road network, including the M5 motorway.</li> <li>▪ 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).</li> </ul>					



## 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 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.

<b>Human Health and Well-being</b>	
<b>Potential Significant Effects and Mitigation Possibilities:</b>	
<b>International/ National/ Transboundary</b>	<ol style="list-style-type: none"> <li>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 that have been on the site since 1967 (see Appendix 4), suggests that the risk to the public is extremely low with total dosage from all sources (including direct radiation) estimated as being less than 7% 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.</li> <li>2. Cumulative effects: The cumulative effect of this discharge and a number of others being considered has the potential to increase radiation doses to the UK population, and possibly citizens of other countries to a more significant level than that currently observed. 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. This is particularly the case with a new power station at the site as there are other existing and sites on the Severn Estuary.</li> </ol>
<b>Regional/ Local</b>	<ol style="list-style-type: none"> <li>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 Oldbury do not cause unacceptable risk to health.</li> <li>4. Other health impacts: 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<sup>6</sup>, a precautionary approach be adopted to the routing of any required power lines. In addition, it would be prudent to undertake a project level health impact assessment to evaluate this potential effect together with those which may be associated with routine plant emissions and transport-related air pollution and noise.</li> <li>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</li> </ol>

<sup>6</sup> [http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb\\_C/1195733817602](http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1195733817602)

## Human Health and Well-being

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 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. Disease clusters: In the past, there has been a lot of publicity about clusters of cancerous diseases, particularly childhood leukaemia's, around nuclear power station sites. This subject was researched in 2005 by COMARE (Committee on Medical Aspects of Radiation in the Environment) when they looked at the incidences of childhood leukaemia and non-Hodgkin lymphoma and other malignant tumours around the UK nuclear power station sites, including Oldbury. This study found that the expected number of cases of both childhood leukaemia and non-Hodgkin lymphoma and other malignant tumours were statistically no higher than would be expected for a typical area with similar population in Britain as a whole.
8. Health services: The influx of workers required for the construction phase of the proposed new power station may put a strain on local health services as may, though to a lesser extent, the station operational staff. Given this situation, it would be prudent to review the need for appropriate additional health service capacity during the planning process.
9. Health and safety issues: The work associated with the construction and operation of a nuclear power plant at Oldbury 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.
10. 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.
11. 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

## Human Health and Well-being

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.

12. **Community well-being:** The South Gloucestershire Council area is not a deprived area, although living environment deprivation and barriers to housing and services are greater than the average for England as a whole. The siting of a new nuclear power station at Oldbury should help to alleviate these deprivations somewhat as more jobs will be created in the area leading to an increase in community wealth, additional housing and other associated neighbourhood infrastructure.
  
13. **Community disturbance:** The presence of, and more particularly the construction of, a nuclear power station at the 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. 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 all project phases.
  
14. **Employment:** Whilst employment levels in the South Gloucestershire Council area are high compared to the rest of England, there are still people seeking work in this area and the region in general. As has been demonstrated<sup>7</sup>, 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 Oldbury 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	Mitigation and Monitoring Possibilities
<ul style="list-style-type: none"> <li>The possibility that the cumulative effects of all future nuclear plants will increase radiation doses to the UK population, and possibly citizens of other countries.</li> <li>The possibility of local and regional health risks from the likely permitted discharges from the proposed new Oldbury power station.</li> <li>The potential for electromagnetic fields generated by any required additional power lines to cause adverse health effects in the local and regional population.</li> </ul>	<ul style="list-style-type: none"> <li>Ensure potential cumulative effects are calculated and assessed when planning and consenting all future nuclear power plants.</li> <li>Undertake a health impact assessment to predict the effects of the power station discharges on the local and regional population.</li> </ul>

<sup>7</sup> Waddell G and Burton K (2006): 'Is work good for your health and well-being?', TSO, London

### Human Health and Well-being

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

<b>Cultural Heritage</b>
<p><b>AoS Objective:</b>                      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</p> <p><b>Guide questions:</b>                      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?</p>
<b>Potential Receptors:</b>
Built heritage, archaeology and historic landscapes of local to national importance.
<b>Potential Significant Effects and Mitigation Possibilities:</b>
<p><b>International/ National/ Transboundary</b></p> <ol style="list-style-type: none"> <li>1. The nearest scheduled monument consists of Oldbury Camp hillfort which lies c.1.4km to the south. A potential impact on its setting may arise from the development of a nuclear power station, as for other scheduled monuments in the wider vicinity.</li> <li>2. There are also 6 Grade I and 16 Grade II* listed buildings within 5km of the existing nuclear power stations and a potential impact on their settings may arise from the development. All setting issues will need to be addressed by the nominator at the project level stage.</li> </ol>
<p><b>Regional/ Local</b></p> <ol style="list-style-type: none"> <li>3. The Registered Park and Garden of Thornbury Castle lies c.4.3km to the south-east and there is a potential impact on its setting.</li> <li>4. Thornbury Conservation Area lies c.4.2km to the south-east and there is a potential impact on its setting.</li> <li>5. There are no listed buildings within or adjacent to the existing nuclear power stations. However, there are 228 Grade II listed buildings within c.5km and there may be an impact on their settings. All setting issues will need to be addressed by the nominator at the project level stage.</li> <li>6. Many of the fields around the existing site are shown on a 19th century Ordnance Survey map and there is potential for historic hedgerows and landscape to exist within the site.</li> <li>7. The existing power station is located in an area of high archaeological potential incorporating remains from the prehistoric, Roman and later periods. Buried land surfaces of prehistoric date are also known within close vicinity. As such the area is likely to be considered to be of at least local or regional archaeological importance. As a minimum, an archaeological watching brief will be required during construction, however, it is more likely that a detailed archaeological investigation of the area will be required, including intrusive investigation (for example trial trenching and detailed recording).</li> </ol>

<b>Cultural Heritage</b>						
<p>8. No impacts are likely during operation unless potential setting impacts on monuments in the wider vicinity cannot be mitigated against.</p> <p>9. Impacts to the buried archaeological resource are possible during decommissioning as excavations are likely to be required. Reinstatement of the area following decommissioning is unlikely to mitigate for earlier impacts.</p>						
<b>Summary of Significant Effects:</b>			Timescale	C	O	D
			Significance	-	-	-
			Likelihood	M	M	M
<p><b>Significant Effects</b>                      Main effects would be at a local scale, within the footprint of the proposed new facility. Effects would be permanent and irreversible.</p> <p>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.</p>			<p><b>Mitigation and Monitoring Possibilities</b>                      An unknown archaeological (buried) resource is potentially present. Further detailed investigations (field evaluation, trial trenching etc.) are likely to be required prior to construction, with an excavation and/or watching brief required during the construction phase (during ground preparation and excavations).</p> <p>It may be possible to mitigate against potential adverse setting effects on heritage assets through appropriate landscaping/planting schemes.</p>			

<b>Landscape</b>
<p><b>AoS Objective:</b>                      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><b>Guide questions:</b>                      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>
<b>Potential Receptors:</b>
<ul style="list-style-type: none"> <li>• The landscape character and visual amenity of visitors to and residents of nearby AONBs may be affected, at a distance of over 10km.</li> <li>• The landscape character, landscape value/visual amenity and perception of tranquillity of visitors to the area and residents within National Character Area 106 will be affected.</li> <li>• The landscape character, landscape value/visual amenity and perception of tranquillity of visitors to and residents of the three Landscape Character Types within South Gloucestershire will be affected.</li> </ul>
<b>Potential Significant Effects and Mitigation Possibilities:</b>
<b>International/ National/ Transboundary</b>
<ol style="list-style-type: none"> <li>1. The ridges along the western side of the Severn Estuary, which are partly within Wales, form a backdrop to the site and thus views from high ground within this south-eastern corner of South Wales are likely to be significant.</li> <li>2. The nearest National Park to the site lies over 30km to the west – the Pontypool section of the Brecon Beacons National Park within Wales. It is possible that the site is visible from Pen-y-Fan ( the highest point ) within the central part of this National Park. However the distance from the site and the visibility of the existing Power Station means that the National Park will not be significantly affected by the site.</li> <li>3. The Wye Valley AONB is located within 8km to the west of the site on the other side of the Severn Estuary. Although not directly affected, views of the site are likely from certain locations within the designated area of the AONB, both at present and over the long term.</li> <li>4. The Cotswolds AONB is located 12km to the north-east of the site (Also NCA 7 –Cotswolds). Although not directly affected, the site will be visible from the open high ground within the southern section of this AONB and thus have some visual and indirect landscape impact.</li> </ol>
<b>Regional/ Local</b>
<ol style="list-style-type: none"> <li>5. The site itself is not located in a designated landscape. The site is located within National Character Area (NCA) 106: Severn and Avon Vales. This</li> </ol>



## Landscape

assessment identifies the adjoining area as follows :‘On the southern side the industrial complexes of Avonmouth and the riverside power stations dominate but just inland there is the rich pasture land of the Vale of Berkeley with a strong pattern of medium-size fields with frequent copses but few large woods and the tree cover depleted by Dutch Elm disease, remote and rather bleak’. The Cotswold outlier Bredon Hill is the highest landform within this area and distant views from it are possible.

6. A short distance to the north-west lies the Forest of Dean, the District covers the land immediately to the west of the site, on the western shore of the Estuary. The site is visible from several of the LCA’s within this District. (see Forest of Dean LCA 2002).
7. Given the likely scale of any new development, it will not be possible to mitigate for all the landscape and visual impacts over a long timescale, either immediately surrounding the site or from the areas of higher ground, from which the site is visible. In addition, new development alongside the existing facility will add to the landscape and visual impacts of the existing Power Station, which is already a prominent feature along the coast.
8. The existing Oldbury power station is specifically identified as falling within the Severn Shoreline and Estuary Landscape Character Area 21 as defined in the South Gloucestershire Council Landscape Character Assessment which was adopted as SPD in 2005. 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, offshore rock exposures and local patterns of erosion and deposition within the Estuary. 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 the new sea defence wall. 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.
9. Mitigation potential includes: Protection measures allowing for the conservation of existing vegetation in the temporary construction laydown area, avoidance of temporary laydown areas on the foreshore. Siting of new power station building and ancillary facilities in close proximity to one another and the existing power station buildings to avoid a significant broadening of visual impact. Extension and enhancement of the existing river wall rather than creation of a new one. 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 tidal pattern within the Estuary. Provision of buffer zones between construction areas and the two dwellings to the north of the existing Power Station; delivery of construction materials by river 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 include landscape restoration and off site enhancement measures, including creation of wetland lagoons, tree planting, grassland and hedgerow restoration to the decommissioned site , the temporary construction areas and the surrounding landscape . Also the 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 this potential site design and mitigation in place, local impacts could be reduced to a slight adverse to neutral level after decommissioning, however, there are still likely to be some localised long term adverse effects.

Landscape						
<b>Summary of Significant Effects:</b>			Timescale	C	O	D
			Significance	-	-	0?
			Likelihood	M	M	M
<p><b>Significant Effects</b></p> <ul style="list-style-type: none"> <li>During construction and operation the main direct impacts would be at local level and over time these could be largely compensated for. However, there are likely to be some long lasting adverse indirect landscape and visual impacts on the surrounding areas including parts of the AONBs of Wye Valley and the Cotswolds; the Forest of Dean District and land to the east including the Oldbury Levels and Severn Ridges, with limited potential for mitigation. The existing power station is already a prominent built feature from local viewpoints and is visible from some long-distance viewpoints, particularly from areas of high ground. 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.</li> <li>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 is 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.</li> </ul>			<p><b>Mitigation and Monitoring Possibilities</b></p> <ul style="list-style-type: none"> <li>Given the scale of the likely development, fully effective mitigation during the construction and operational phases of adverse effects is unlikely.</li> <li>Whilst there is some potential for landscape/ecological mitigation and restoration and the potential for these to be delivered and monitored through an integrated land management plan. However, the time scales involved present uncertainties as to long term land uses and therefore the final form of any landscape mitigation.</li> </ul>			

<b>Soils, Geology and Land use</b>	
<b>AoS Objective:</b>	<p>19. to avoid damage to geological resources</p> <p>20. to avoid the use of greenfield land and encourage the re-use of brownfield sites</p> <p>21. to avoid the contamination of soils and adverse impacts on soil functions</p>
<b>Guide questions:</b>	<p>Will it result in the compaction and erosion of soils?</p> <p>Will it lead to the removal or alteration of soil structure and function?</p> <p>Will it lead to the contamination of soils which would affect biodiversity and human health?</p> <p>Will it compromise the future extraction/ use of geological/ mineral reserves?</p> <p>Will it result in the loss of agricultural land?</p> <p>Will it lead to damage to geological SSSIs and other geological sites?</p> <p>Will it result in the loss of Greenfield land?</p> <p>Will it adversely affect land under land management agreements?</p>
<b>Potential Receptors:</b>	
	<p>The site lies within a local area of agricultural land use. There are no significant geological designated site lies within the local vicinity.</p> <p>Adjacent agricultural land/green field land (to be confirmed by nomination) adjacent to the site.</p>
<b>Potential Significant Effects and Mitigation Possibilities:</b>	
<b>International/ National/ Transboundary</b>	<ol style="list-style-type: none"> <li>1. The site potentially lies adjacent to the Seven Estuary SSSI /SPA/SAC/RAMSAR. Construction activities and operational activities are likely to have a detrimental effect to the short/medium term soil quality within the area of the proposed development. Compaction/removal/alteration of soils is may potentially affect the soil quality within these designated sites, which may also affect biodiversity; however this is addressed in the appraisal of Biodiversity.</li> <li>2. There are no geological designations of note within the local vicinity.</li> <li>3. The loss of greenfield land is not considered to be significant on a National level.</li> </ol>
<b>Regional/ Local</b>	<ol style="list-style-type: none"> <li>4. The soils in the local area adjacent to the site lie within a region classified to be of lime rich to moderate fertility by the National Soils Resources Institute. Any development is likely to have a local effect on agricultural land use and agriculture in prevalent in the local area. The area is currently within an agri-environmental scheme and any development is likely to have financial implications to the local area. 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</li> </ol>

<b>Soils, Geology and Land use</b>						
decommissioned however the original soils matrix is unlikely to be restored.						
5. Construction of new plant upon greenfield sites. The loss of greenfield land is likely to be of local significance.						
6. 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.						
7. Several landfills associated with the existing power station have been identified to the north and south of the existing power station. Further assessment of these landfills would be covered by the site specific EIA. All material generated within these area could be managed by appropriate construction activities in conjunction with the relevant regulatory bodies.						
<b>Summary of Significant Strategic Effects:</b>			Timescale	C	O	D
			Significance	-	-?	-?
			Likelihood	M	M	M
<b>Significant Effects</b>			<b>Mitigation and Monitoring Possibilities</b>			
<ul style="list-style-type: none"> <li>The construction of the power station and associated infrastructure (including transmission lines/towers) will lead to the direct loss of soil structure. This may include impacts on soils that maintain terrestrial habitats, including designated nature conservation sites; Seven Estuary SSSI /SPA/SAC/RAMSAR. This is considered further in the biodiversity appraisal.</li> </ul>			<ul style="list-style-type: none"> <li>Limitation of the footprint of the development reducing the area of soils affected. Avoidance of any soils within designated sites of ecological importance.</li> </ul>			

<b>Water - Hydrology and Geomorphology</b>
<p><b>AoS Objective:</b> 15. To avoid adverse impacts on surface water hydrology and channel geomorphology (including coastal geomorphology).</p> <p><b>Guide questions:</b> 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?</p>
<b>Potential Receptors:</b>
Local and district resident population and tourists, local and district ecosystems in estuarial waters and on land.
<b>Potential Significant Effects and Mitigation Possibilities:</b>
<p><b>International/National/Transboundary</b> The potential effects on surface water hydrology and fluvial and coastal geomorphology are likely to be limited to the Severn Estuary and the adjoining coastline within approximately 10-20km of the site. It would be necessary for the nominator to undertake a data collection and modelling exercise to confirm the spatial extent of this impact at the EIA stage.</p>
<p><b>Regional/Local</b></p> <ol style="list-style-type: none"> <li>1. The site of the existing Oldbury power station is not within the area at risk from the 1/100 year flood event, but is completely surrounded by areas that are at risk. The site appears to be raised above the floodplain and protected by formal sea defences. However, climate change driven rises in sea-level rise may increase flood risk over the coming decades and any further development would require encroachment into the area at risk of flooding. Further details are provided in the appraisal of flood risk issues.</li> <li>2. The provision of cooling water for a new power station at the site may require excavation/dredging within the estuary to enable the construction of a channel and/or pipeline for the abstraction and return of the cooling water. 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 estuarine hydrodynamics and sedimentation processes. The effects of construction and operation of the cooling water system on coastal processes, estuarine hydrodynamics and sediment transport within the Severn Estuary could be reduced or potentially eliminated by suitable design and construction methods. A tidal reservoir is already in place at the site and may be incorporated into the design of potential mitigation options.</li> <li>3. 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</li> </ol>

<b>Water - Hydrology and Geomorphology</b>																
<p>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.</p>																
<b>Summary of Significant Strategic Effects:</b>				<table border="1"> <tr> <td>Timescale</td> <td>C</td> <td>O</td> <td>D</td> </tr> <tr> <td>Significance</td> <td style="background-color: yellow;">-</td> <td style="background-color: yellow;">-</td> <td style="background-color: yellow;">-</td> </tr> <tr> <td>Likelihood</td> <td>M</td> <td>M</td> <td>M</td> </tr> </table>	Timescale	C	O	D	Significance	-	-	-	Likelihood	M	M	M
Timescale	C	O	D													
Significance	-	-	-													
Likelihood	M	M	M													
<p><b>Significant Effects</b></p> <ul style="list-style-type: none"> <li>• Additional coastal defence works on coastal processes, estuarine hydrodynamics and sediment transport, and any indirect effects on internationally designated habitats.</li> <li>• Works to provide (and discharge) cooling water on coastal processes, estuarine hydrodynamics and sediment transport, and any indirect effects on internationally designated habitats.</li> </ul>		<p><b>Mitigation and Monitoring Possibilities</b></p> <ul style="list-style-type: none"> <li>• Suitable design, including use of SuDs.</li> <li>• Selection of appropriate construction methods.</li> </ul>														

**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:**

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?

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?

**Potential Receptors:**

Local and district resident population and tourists, local and district ecosystems in estuarial waters. 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**

1. The main liquid discharges from the a power station at the site 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 EA 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).
2. In the case of the discharge of cooling water it is unlikely to be feasible to eliminate some changes in thermal conditions locally, particularly at times of low tide when the volume of water in the estuary is at a minimum. Detailed appraisal of the proposals for disposal of cooling water will be required to assess the acceptability of this effect. An existing power station with cooling water discharges is already operating at the site and a tidal reservoir is already in place between the site and the estuarial waters.
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 EA to ensure compliance with all relevant legislation.

Water - Water Quality (including surface, coastal and marine)						
<b>Summary of Significant Effects:</b>			Timescale	C	O	D
			Significance	-	-	-
			Likelihood	M	M	M
<b>Significant Effects</b> <ul style="list-style-type: none"> <li>Thermal impact of cooling water discharges (if this mode of cooling were to be adopted). However, this effect is of local and regional significance, particularly because of the potential impacts on the SAC, SPA, SSSI and RAMSAR sites of the Severn Estuary.</li> </ul>			<b>Mitigation and Monitoring Possibilities</b> <ul style="list-style-type: none"> <li>Thermal discharges will need to be consented by the EA. The discharge quality will need to comply with existing standards or meet the no deterioration standard.</li> </ul>			



Water – Water supply and demand						
<p><b>AoS objective:</b> 17. To avoid adverse impacts on the supply of water resources.</p> <p><b>Guide questions:</b> Will it adversely affect water supply as a result of abstraction? Will it increase demand for water?</p>						
<b>Potential Receptors:</b>						
Local and district resident population and tourists. District ecosystems dependent on surface water features.						
<b>Potential Significant Effects and Mitigation Possibilities:</b>						
<b>International/National/Transboundary</b> Not significant.						
<b>Regional/Local</b>						
<ol style="list-style-type: none"> <li>The site lies within the Little Avon Catchment Abstraction Management Strategy (CAMS) area. The site is not located in either of the CAMS Water Resource Management Units (WRMUs). Accordingly surface and groundwater in the vicinity of the site is not currently used for water supply.</li> <li>Construction and operation may 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. 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 there may be an impact on Bristol Water's supply-demand balance which will need to be assessed and quantified.</li> <li>Increased water supply would probably be derived from multiple sources within the Bristol Water plc region, hence additional water supply could impact aquatic ecosystems within and downstream of catchments used to provide additional water.</li> </ol>						
<b>Summary of Significant Effects:</b>			Timescale	C	O	D
			Significance	-	O	O
			Likelihood	M	H	H
<b>Significant Effects</b>			<b>Mitigation and Monitoring Possibilities</b>			
<ul style="list-style-type: none"> <li>Increased demand during the construction phase. The potential magnitude and duration of increased water demand will depend on the timing of the site development in relation to the activities (operation or decommissioning) of the existing site. Similar Significant effects are likely to apply to wastewater production from the site.</li> </ul>			<ul style="list-style-type: none"> <li>Studies to ensure that capacity of water and wastewater infrastructure in WRZ is sufficient, and that plans to address Bristol Water Co. supply-demand deficit are sufficient to meet any increase in demand associated with the development of this site.</li> </ul>			

<b>Water - Groundwater Quality and Flow</b>																
<b>AoS Objective:</b> 18. To avoid adverse impacts on groundwater quality, distribution and flow and to help meet the objectives of the Water Framework Directive																
<b>Guide questions:</b> 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?																
<b>Potential Receptors:</b>																
Local and district resident population and tourists, local and district ecosystems with connections to groundwater.																
<b>Potential Significant Effects and Mitigation Possibilities:</b>																
<b>International/National/Transboundary</b> Not significant.																
<b>Regional/ Local</b>																
<ol style="list-style-type: none"> <li>The site is located on the Avonmouth Mercia Mudstone aquifer; there are no Groundwater Protection Zones in close vicinity of the site but there are Groundwater Protection Zones covering different areas of this aquifer. Localised groundwater pathways may exist between the site and the wider aquifer, hence accidental discharges or construction disturbance at the site could cause deterioration in groundwater quality and flow quantity in the mudstone aquifer.</li> <li>Increased water supply would probably be derived from multiple sources within the Bristol Water plc region. Additional water supply could impact groundwater bodies used to provide additional water. Increased groundwater abstraction could lead to impacts on groundwater dependent surface water features and aquatic ecosystems.</li> </ol>																
<b>Summary of Significant Effects:</b>				<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;">-</td> <td style="text-align: center;">-</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	Likelihood	M	M	M
Timescale	C	O	D													
Significance	-	-	0													
Likelihood	M	M	M													
<b>Significant Effects</b>		<b>Mitigation and Monitoring Possibilities</b>														
<ul style="list-style-type: none"> <li>Potential impacts on local groundwater bodies.</li> </ul>		<ul style="list-style-type: none"> <li>Studies to ensure that local groundwater bodies are investigated and suitable design is adopted to mitigate potential impacts.</li> </ul>														

Flood Risk						
<p><b>AoS Objective:</b> 14. To avoid increased flood risk (including coastal flood risk) and seek to reduce risks where possible</p> <p><b>Guide questions:</b> Will it result in demand for higher defence standards?</p>						
<b>Potential Receptors:</b>						
Site workers. Local, District ecosystems in coastal waters and on foreshore.						
<b>Potential Significant Effects and Mitigation Possibilities:</b>						
<p><b>International/ National/ Transboundary</b> Not significant.</p>						
<p><b>Regional/ Local</b></p> <ol style="list-style-type: none"> <li>The site is located partially in Flood Zone 1 and partially in Flood Zone 3. It is likely through the impacts of climate change on sea level rise that flood risk to the site will increase.</li> <li>There are existing defences, the composition and standard of protection of which is unknown.</li> <li>To mitigate against flood risk for the lifetime of the development ongoing maintenance and improvement of these defences may be required, which could effect coastal processes.</li> <li>To avoid extensive mitigation, development should be located in the areas at lowest risk of flooding.</li> </ol>						
<b>Summary of Significant Effects:</b>			Timescale	C	O	D
			Significance	-	-	-
			Likelihood	M	M	M
<p><b>Significant Effects</b></p> <ul style="list-style-type: none"> <li>Main effects are through the continued management and improvement of existing natural defences which could effect coastal processes.</li> </ul>			<p><b>Mitigation and Monitoring Possibilities</b></p> <ul style="list-style-type: none"> <li>It may be possible to mitigate these effects appropriate management and techniques for improving the existing defences.</li> </ul>			

## Appendix 3: Plans and Programmes Review (Regional)

### Draft Regional Spatial Strategy for the South West 2006-2026 (South West Regional Development Agency)

The Draft RSS for the South West is intended to replace the existing Regional Planning Guidance for the South West. It outlines sub-regional policy and guidance for the environment, housing, transport and the economy and employment.

#### *Housing and Employment:*

- Bridgwater is identified as a Strategically Significant Town and the Draft RSS requires that an average of 310 dwellings per year are provided up to 2026.
- Provision for job growth in the Taunton and Bridgwater travel to work areas will be made for 18,500 jobs over the plan period.

#### *Transport:*

- Development of the A303/A358 as a strategic route.
- Promotion of strategic network for HGV as opposed to country routes.

#### *Nature Conservation:*

- The distinctive habitats and species of the South West will be maintained and enhanced in line with national targets and the South West Regional Biodiversity Action Plan.

#### *Historic Environment:*

- The historic environment of the South West will be preserved and enhanced.

#### *Coastal Planning:*

- In order to improve coastal planning and achieve a consistent, cross boundary approach local authorities on the coast will co-ordinate development plans, Shoreline Management Plans and other programmes affecting the coastal zone and support the sustainable planning and management of adjacent coastal areas, by working across borders, as in the Severn Estuary Partnership.

#### *Flood Risk:*

- Protect flood plains and land liable to tidal or coastal flooding from development
- Use development to reduce the risk of flooding through location, layout and design

- Relocate existing development from areas of the coast at risk, which cannot be realistically defended

*Renewable Energy:*

- By 2010 a minimum target of 509 to 611 MWe installed generating capacity, from a range of onshore renewable electricity technologies - Somerset - 61-81

*Water Resources:*

- The region's network of ground, surface and coastal waters and associated ecosystems will be protected and enhanced

*Air Quality:*

- The impacts of development proposals on air quality must be taken into account

*Radioactive Waste:*

- The Draft RSS states that it is not appropriate to consider further details of possible management and disposal options for radioactive waste stored in the region until the national reviews on managing radioactive waste have been completed.

LINK: [http://southwest-ra.gov.uk/nqcontent.cfm?a\\_id=538](http://southwest-ra.gov.uk/nqcontent.cfm?a_id=538)

### **Regional Economic Strategy for South West England 2006-2015 (South West Regional Development Agency)**

The Regional Economic Strategy (RES) provides a shared vision for the development of the region's economy. The RES is therefore concerned with the economy of the South West, within the wider context of sustainable development. The Strategy concentrates on those issues which are directly related to improving the economy and ensuring that more people can participate in that economy. It also recognises that a strong social fabric is an important part of the overall well being in the region.

The Vision of the RES is that "*South West England will have an economy where the aspirations and skills of our people combine with the quality of our physical and cultural environment to provide a high quality of life and sustainable prosperity for everyone*". The vision will be realised through three strategic objectives:

- Successful and competitive businesses
- Strong and inclusive communities
- An effective and confident region

LINK: <http://www.southwestrda.org.uk/what-we-do/policy/res-review2005/draft-res.shtm>

### **South West Climate Change Action Plan 2008-2010 (South West Regional Assembly)**

The Action Plan sets out a programme of regionally agreed priority actions to address both mitigation and adaptation activity. The main areas of mitigation activity within the SWCCAP include tackling emissions from existing housing, business and public sector operations, transport, new build, energy generation, and land management. Adaptation activity covers: the region's strategic response to climate change; awareness raising; land and marine management; and adapting to flood risk. The relevant priority objectives are to:

- Identify the parts of the region most vulnerable to extreme weather events and undertake actions to increase resilience.
- Increase business preparation for climate change
- Ensure regional land use practices take account of the impacts of climate change and promote adaptation responses
- Ensure that all relevant regional and sub-regional bodies understand the impacts of, and take action to respond to, increasing flood risk.
- Embed long term carbon management and resource efficiency in business planning and investment and economic development
- Undertake regional activity to support regional and local multi-modal carbon reduction and demand management
- Stimulate the increased installation of renewable energy technologies in the region
- Provide support and coordination of activity to achieve low and zero carbon new development by 2016 (housing) and 2019 (non domestic sector)

LINK: [http://www.southwest-ra.gov.uk/media/SWRA/Climate%20Change/Climate\\_Change\\_Action\\_Plan.pdf](http://www.southwest-ra.gov.uk/media/SWRA/Climate%20Change/Climate_Change_Action_Plan.pdf)

**Creating Sustainable Communities in the South West 2005 (Office of the Deputy Prime Minister)**

The report describes the actions that will take place to create sustainable communities in the South West up to 2010. The report focuses on:

- achieving a better balance between housing availability and the demand for housing - including improving affordability
- ensuring people have decent places to live - including cleaner, safer and greener localities
- tackling disadvantage, including homelessness
- delivering better services through strong effective local government
- promoting the development of the region.

LINK: <http://www.gos.gov.uk/gosw/peoplesc/scomms/>

**Our Environment: Our Future - The Regional Strategy for the South West Environment 2004-2014 (South West Regional Assembly in association with the South West Regional Environmental Network)**

This document highlighted the richness and diversity of the South West environment and its importance to the region's economy and people's sense of well-being. It proposes a Vision and Aims for the region's environmental assets, and identifies a range of pressures on and opportunities for these assets. This leads to the selection of six key issues that need to be tackled, with proposed objectives and actions for addressing each issue. The objectives are:

- To minimise greenhouse gas emissions and respond to the risks, challenges and opportunities presented by climate change.
- To ensure that our natural resources are used sustainably, with minimum environmental damage and waste generation, so as to reduce pollution and protect the quality of the region's environment.
- To enhance the ability of the food, farming and forestry sectors to provide the environmental and social benefits that people in the region need and expect, and help to secure a viable future for them.
- To promote a tourism and leisure industry that conserves and enhances the environment and recognises the region's distinctiveness.
- To promote the wise use of land and a safe and healthy environment for local communities, through the provision of well designed, resource efficient development, contributing to sustainable development through environmental enhancement and ensuring that the South West remains a region of diverse and distinctive heritage, wildlife and landscapes.
- To minimise the environmental impact of the travel and transport necessary to support the social and economic needs of the region.

LINK: <http://www.southwest-ra.gov.uk/media/SWRA/Environment/ENV-strat-main.pdf>

**From Rubbish to Resource: The South West Regional Waste Strategy 2004-2020 (South West Regional Assembly)**

The Regional Waste Strategy aims to ensure that by the year 2020 over 45% of waste is recycled and reused and less than 20% of waste produced in the region will be landfilled. The strategy defines key areas for action, such as adopting the waste hierarchy, to be carried out by the people of the region and by organisations in order to achieve the aim and reduce the amount of waste being produced. The strategy's policies and actions address local authorities, the waste industry, non-governmental organisations and community groups. Spatial elements of the Regional Waste Strategy have been incorporated into the Draft RSS policies on waste management.

LINK: [http://www.southwest-ra.gov.uk/ngcontent.cfm?a\\_id=500](http://www.southwest-ra.gov.uk/ngcontent.cfm?a_id=500)

**South West Biodiversity Action Plan 1997 (The South West Biodiversity Partnership)**

The South West Biodiversity Action Plan identifies 18 habitats and 12 species within the region for which specific action plans have been produced. Regional habitat and species action plans have been produced for the following reasons:

- To make it easier for the UK biodiversity plans to be implemented at the local level
- To enable organisations that function at a regional (or similar administrative boundaries) to recognise those conservation priorities relevant to their boundaries
- To inform regional planning of the main biodiversity issues within the South West
- To ensure the best possible information base on which decisions can be made
- To provide consistent information and identify priorities

LINK: [http://www.ukbap.org.uk/Library/SWBIP\\_Final.pdf](http://www.ukbap.org.uk/Library/SWBIP_Final.pdf)



### **Draft River Basin Management Plan for the Severn 2008 (Environment Agency)**

This draft plan describes how the region will meet the challenge of the Water Framework Directive to improve the quality of every aspect of the water environment in the South West. The draft plan proposes new actions to manage the water environment in the South West river basin district. It considers a number of environmental outcomes expected to be achieved as a result of the planned actions under the following headings:

- Improving rural land management
- Reducing the impact of transport and built environments
- Securing sustainable amounts of water
- Improving wildlife habitats
- Addressing point source pollution

It is noted that the all RBD's are currently undergoing a consultation until 22 June 2009 and may therefore be subject to change after that date.

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

### **Severn Estuary Shoreline Management Plan 2000 (Severn Estuary Coastal Group)**

The Aim of this Shoreline Management Plan is to provide the basis for sustainable coastal defence policies within the Severn Estuary, from Lavernock Point and Brean Down up to Haw Bridge, and to develop objectives for the future management of the shoreline. The SMP provides a framework for shoreline management decisions: it identifies management objectives and preferred strategic shoreline management options for coastal defence which will enable the subsequent studies to be undertaken for the development of site-specific schemes. Sustainable coastal defence policies need to take account of the inter-relationships between defences, developments and processes within the Estuary, and they should avoid as far as possible tying future generations into inflexible and expensive options for defence.

It is noted that the all RBD's are currently undergoing a consultation until 22 June 2009 and may therefore be subject to change after that date.

LINK: <http://www.ndascag.org/SMPnd.html>

## Appendix 4: Baseline Information

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

### Air

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Air</b>				
<b>Air Quality</b>	1,2,3	<p>Air quality in the South West is generally good with low levels of sulphur, nitrogen dioxide and particulates in comparison to the rest of England. However, pockets of poor air quality exist in the region, especially within large urban industrial areas such as Bristol.</p> <p>The prevailing wind direction is predominately southwest with high frequency north-easterly winds.</p> <p>There are 28 Air Quality Management Areas (AQMA) in the South West, none of which are in the South Gloucestershire Council region.</p>		<p>The average number of days with moderate or higher air pollution has generally decreased significantly in urban areas since 1993, largely because of a reduction in particles and sulphur dioxide. In rural areas, where ozone is the main cause of pollution, there has been no overall trend. Ozone levels are naturally high in the South West due to the close proximity to the coast and high altitudes.</p>

#### Key to Data Sources

<b>1</b>	South West Observatory State. State of the South West 2008 [online] available: <a href="http://www.swo.org.uk/observatory/links-1/state/state-of-the-south-w-1.shtm">http://www.swo.org.uk/observatory/links-1/state/state-of-the-south-w-1.shtm</a> [accessed 03 March 2009]
<b>2</b>	Met Office: Regional Climate – South West England [online] available: <a href="http://www.metoffice.gov.uk/climate/uk/sw/">http://www.metoffice.gov.uk/climate/uk/sw/</a> [accessed 03 March 2009]
<b>3</b>	UK Air Quality Archive (online) available: <a href="http://www.airquality.co.uk/archive/laqm/laqm.php">http://www.airquality.co.uk/archive/laqm/laqm.php</a> [accessed 03 March 2009]

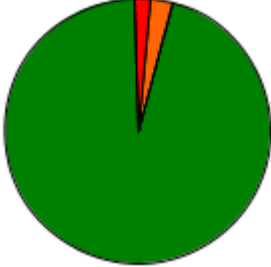
## Biodiversity and Ecosystems


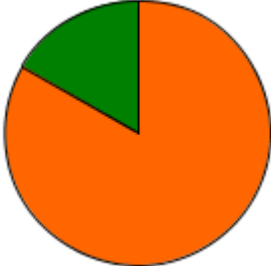
Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Biodiversity and Ecosystems</b>				
<p><b>The South West Biodiversity Action Plan</b></p> <p><b>Protected Habitats</b></p>	1	<p>18 habitat types are recognised within the South West Biodiversity Action Plan, 6 plans (Coastal Sand Dunes, Coastal Floodplain and Grazing Marsh, Estuaries, Maritime Cliffs and Slopes, Reedbeds and Sea Grass Beds) are considered particularly relevant to the site.</p> <p>Nearly a tenth of the Region's land area is designated as nationally and internationally important wildlife sites, many of which are unique in Europe. The maritime environment is particularly significant in the South West as the ratio of coastline to land area is the highest of any region. At a more local level, areas of wildlife value may be designated as Local Nature Reserves, County Wildlife Sites or non-statutory nature reserves. The South West supports a high proportion of some of the UK's rarest and most endangered habitats. Many are UK priority. Many of these, especially soft coastal habitats (for example Bridgwater Bay), have been identified as particularly vulnerable to climate change.</p>		
<p><b>The South West Biodiversity Action Plan</b></p> <p><b>Protected Species</b></p>	2	<p>The South West Biodiversity Action Plan was developed in 1997. It has since been updated and complemented with the South West Biodiversity Implementation Plan. 12 species are recognised within the South West Biodiversity Action Plan, 3 plans (Great Crested Newt, Water Vole and Pipistrelle Bat) are considered particularly relevant to the site.</p> <p>The South West supports some 25 species that are globally important, over 700 species that are of national conservation concern, and 34 species endemic to the UK, 11 of which are only found in the South West.</p>		

Indicator	Data Source	Current Data	Comparators	Trend													
<b>South Gloucestershire Biodiversity Action Plan</b>	3,4	The South Gloucestershire Action Plan was consulted on and adopted by the Council in 1997. It includes plans for 7 priority habitats, 8 UK priority species and 7 local priority species. These were chosen by the Biodiversity Partnership to reflect habitats and species that can be easily identified, will inspire action and reflect a healthy ecosystem.															
<b>Natura 2000 sites (N2K)</b>	5	There are 5 N2K sites within 20 km of the site: <ul style="list-style-type: none"> <li>• Severn Estuary</li> <li>• River Wye</li> <li>• Wye Valley and Forest of Dean Bat Sites</li> <li>• Wye Valley Woodlands</li> <li>• Avon Gorge Woodlands</li> </ul>															
<b>Ramsar sites</b>	5	There is 1 Ramsar sites within 20 km of the site: <ul style="list-style-type: none"> <li>• Severn Estuary Ramsar</li> </ul>															
<b>Sites of Special Scientific Interest (SSSI)</b>	6	<p>There are 985 SSSI within the South West region of which 122 are situated within Gloucestershire.</p> <p><b>Region: South West</b></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>85.12%</td> <td>50.53%</td> <td>34.59%</td> <td>10.17%</td> <td>4.68%</td> <td>0.04%</td> </tr> </tbody> </table>				% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	85.12%	50.53%	34.59%	10.17%	4.68%	0.04%
% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed												
85.12%	50.53%	34.59%	10.17%	4.68%	0.04%												

Indicator	Data Source	Current Data	Comparators	Trend												
		<div data-bbox="562 379 981 592" style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li><span style="color: green;">■</span> % Area favourable</li> <li><span style="color: lightgreen;">■</span> % Area unfavourable recovering</li> <li><span style="color: orange;">■</span> % Area unfavourable no change</li> <li><span style="color: red;">■</span> % Area unfavourable declining</li> <li><span style="color: brown;">■</span> % Area destroyed / part destroyed</li> </ul> </div> <div data-bbox="1043 355 1317 624" style="text-align: center;"> </div> <p data-bbox="555 639 869 667"><b>County: Gloucestershire</b></p> <table border="1" data-bbox="562 711 1722 868"> <thead> <tr> <th data-bbox="562 711 712 815">% Area meeting PSA target</th> <th data-bbox="712 711 880 815">% Area favourable</th> <th data-bbox="880 711 1099 815">% Area unfavourable recovering</th> <th data-bbox="1099 711 1319 815">% Area unfavourable no change</th> <th data-bbox="1319 711 1538 815">% Area unfavourable declining</th> <th data-bbox="1538 711 1722 815">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td data-bbox="562 815 712 868">87.72%</td> <td data-bbox="712 815 880 868">72.40%</td> <td data-bbox="880 815 1099 868">15.32%</td> <td data-bbox="1099 815 1319 868">7.41%</td> <td data-bbox="1319 815 1538 868">4.88%</td> <td data-bbox="1538 815 1722 868">0.00%</td> </tr> </tbody> </table> <div data-bbox="562 951 981 1163" style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li><span style="color: green;">■</span> % Area favourable</li> <li><span style="color: lightgreen;">■</span> % Area unfavourable recovering</li> <li><span style="color: orange;">■</span> % Area unfavourable no change</li> <li><span style="color: red;">■</span> % Area unfavourable declining</li> <li><span style="color: brown;">■</span> % Area destroyed / part destroyed</li> </ul> </div> <div data-bbox="1043 927 1317 1195" style="text-align: center;"> </div> <p data-bbox="555 1211 1733 1238">There are 94 SSSI within 20km of the site, 3 of these are considered particularly relevant to the site:</p> <ul data-bbox="555 1278 869 1334" style="list-style-type: none"> <li>Severn Estuary</li> <li>Upper Severn Estuary</li> </ul>	% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed	87.72%	72.40%	15.32%	7.41%	4.88%	0.00%		
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Indicator	Data Source	Current Data	Comparators	Trend												
		<ul style="list-style-type: none"> <li>River Wye</li> </ul>														
<b>Severn Estuary SSSI</b>	7	<p>The Severn Estuary SSSI forms part of larger area which includes the Upper Severn Estuary, the Taf/Ely Estuary SSSI and Bridgwater Bay National Nature Reserve/SSSI. The Severn Estuary lies at the mouth of four major rivers (the Severn, Wye, Usk and Avon) and many lesser rivers.</p> <p>The intertidal zone of mudflats, sand banks, rocky platforms and saltmarsh is one of the largest and most important in Britain. The estuarine fauna includes internationally important populations of waterfowl and large populations of migratory fish.</p> <p>Seven species of migratory fish move through the estuary between the sea and rivers including Atlantic Salmon, Common Eel, Allis Shad, Twaite Shad, Sea Trout, Sea Lamprey and River Lamprey.</p> <p>The SSSI supports large numbers of wintering passage waders and wildfowl, including internationally important numbers of Dunlin, Curlew and Redshank.</p> <p>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>Currently 95.74% of the site is meeting PSA targets:</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>95.74%</td> <td>95.74%</td> <td>0.00%</td> <td>2.42%</td> <td>1.84%</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	95.74%	95.74%	0.00%	2.42%	1.84%	0.00%
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<p><b>Upper Severn Estuary SSSI</b></p>	<p>8</p>	<p>The Upper Severn Estuary SSSI consists of the uppermost part of the Severn Estuary and its marginal saltmarsh and pastureland.</p> <p>The site is of international ornithological importance and supports more than 10,000 wintering wildfowl. Amongst these are internationally significant numbers of Bewick’s Swans, European White-fronted Geese and Wigeon. There are nationally important wintering populations of Gadwall, Shoveler and Pochard. Other wildfowl feeding or resting on the flats or the fields include occasional Lesser White-fronted Geese and Pink-footed Geese. Ducks include Teal, Pintail, Mallard and Tufted Duck. Other habitats in the site include two areas of reed bed dominated by common reed and some species-rich unimproved ridge-and-furrow fields dating from Saxon times. The former support breeding populations of Reed Warbler and Sedge Warbler while the latter provide ideal conditions for ground nesting birds such as Redshank and Snipe.</p> <p>Currently 96.69% of the site is meeting PSA targets:</p> <p><b>SSSI name: Upper Severn Estuary</b></p> <table border="1" data-bbox="562 1043 1816 1235" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">% Area meeting PSA target</th> <th style="text-align: center;">% Area favourable</th> <th style="text-align: center;">% Area unfavourable recovering</th> <th style="text-align: center;">% Area unfavourable no change</th> <th style="text-align: center;">% Area unfavourable declining</th> <th style="text-align: center;">% Area destroyed / part destroyed</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">96.69%</td> <td style="text-align: center;">96.69%</td> <td style="text-align: center;">0.00%</td> <td style="text-align: center;">0.00%</td> <td style="text-align: center;">3.31%</td> <td style="text-align: center;">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	96.69%	96.69%	0.00%	0.00%	3.31%	0.00%
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<b>River Wye SSSI</b>	8	<p>The River Wye supports a number of European Protected species including 7 Annex II species of fish (Allis shad, Twaité Shad, Sea Lamprey, Brook Lamprey, River Lamprey, Atlantic Salmon and Bullhead), Otter and White-clawed crayfish.</p> <p>Currently 16.74% of the site is meeting PSA targets:</p>	<table border="1" data-bbox="562 799 1720 959"> <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>16.74%</td> <td>16.74%</td> <td>0.00%</td> <td>83.26%</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	16.74%	16.74%	0.00%	83.26%	0.00%	0.00%	<div data-bbox="562 1038 981 1251" style="border: 1px solid black; padding: 5px;"> <ul style="list-style-type: none"> <li><span style="color: green;">■</span> % Area favourable</li> <li><span style="color: lightgreen;">■</span> % Area unfavourable recovering</li> <li><span style="color: orange;">■</span> % Area unfavourable no change</li> <li><span style="color: red;">■</span> % Area unfavourable declining</li> <li><span style="color: brown;">■</span> % Area destroyed / part destroyed</li> </ul> </div> 
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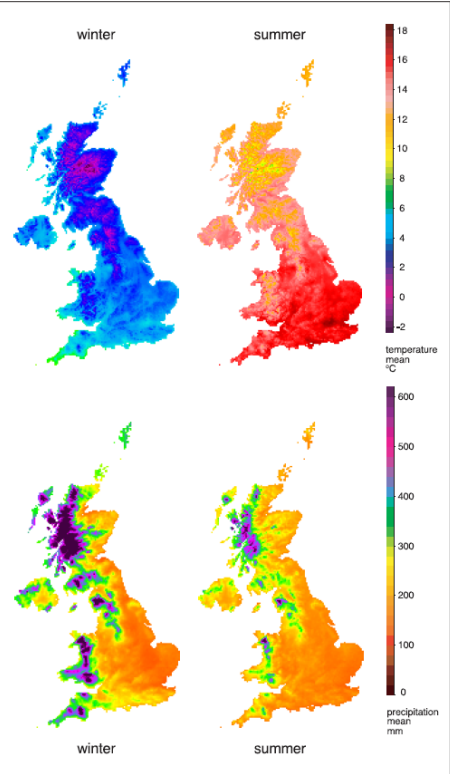
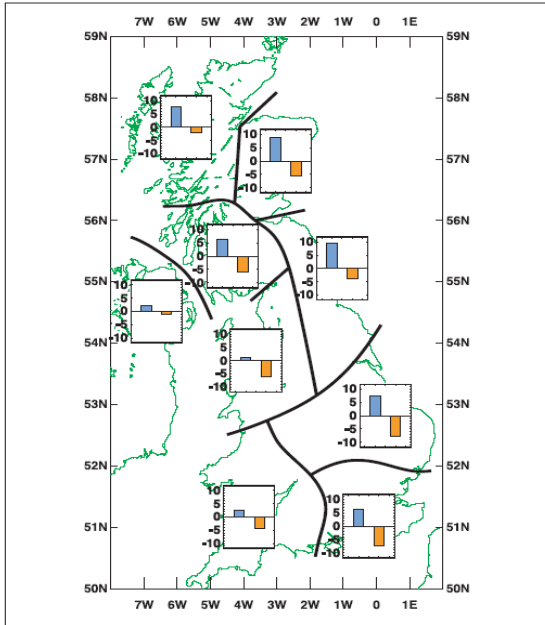
Indicator	Data Source	Current Data	Comparators	Trend
<b>National Nature Reserves (NNR)</b>	9	<p>There are 48 NNR within the South West, 3 within Gloucestershire.</p> <ul style="list-style-type: none"> <li>• Cotswold Commons and Beechwoods</li> <li>• Highbury Wood, lies within 20km of the site.</li> <li>• Lady Park Wood</li> <li>• The Hudnalls and Penhow Woodlands, lies within 20km of the site.</li> </ul>		
<b>Local Nature Reserves (LNR)</b>	10	<p>There are 179 LNR within the South West, 19 within Gloucestershire.</p> <p>The following sites are within 20Km of the site:</p> <ul style="list-style-type: none"> <li>• Cleddon Bog</li> <li>• Huckford Quarry</li> <li>• Three Brooks</li> <li>• Wapley Bushes</li> <li>• Royate Hill</li> <li>• Lawrence Western Moor</li> <li>• Gorse Covert</li> </ul>		
<b>Local Wildlife Sites</b>	11	Information to be obtained from a local records centre at the appropriate time.		

### Key to Data Sources

1	The South West Biodiversity Action Plan, Habitats [online] available: <a href="http://www.wildlifetrust.org.uk/avon/www/Habitats/reg_hab.htm">http://www.wildlifetrust.org.uk/avon/www/Habitats/reg_hab.htm</a>
2	The South West Biodiversity Action Plan, Species [online] available: <a href="http://www.wildlifetrust.org.uk/avon/www/Species/reg_species.htm">http://www.wildlifetrust.org.uk/avon/www/Species/reg_species.htm</a>
3	The UK Biodiversity Action Plan [online] available: <a href="http://www.ukbap.org.uk/lbap.aspx?ID=478">http://www.ukbap.org.uk/lbap.aspx?ID=478</a>

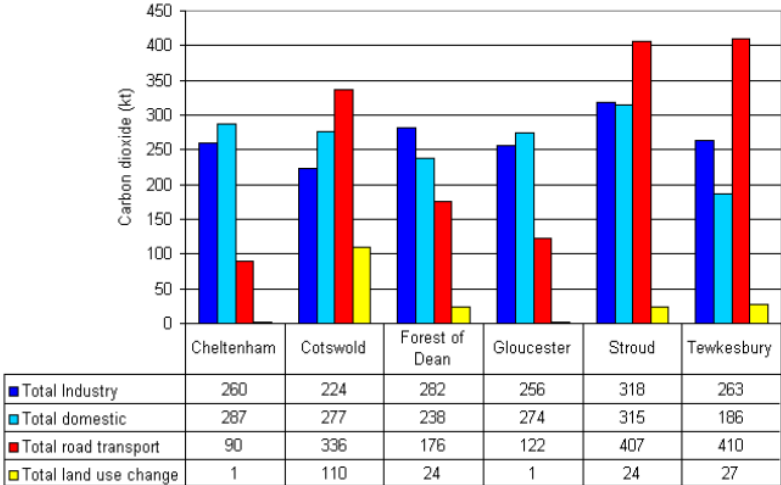
<b>4</b>	South Gloucestershire Biodiversity Action Plan, South Gloucestershire Council [online] available: <a href="http://www.southglos.gov.uk/NR/exeres/ae557f2-9d2b-4232-aa6e-d26b0cf3ead1">http://www.southglos.gov.uk/NR/exeres/ae557f2-9d2b-4232-aa6e-d26b0cf3ead1</a>
<b>5</b>	Joint Nature Conservation Committee (JNCC) [online] available: <a href="http://www.jncc.gov.uk/">http://www.jncc.gov.uk/</a>
<b>6</b>	Natural England, Site of Special Scientific Interest [online] available: <a href="http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&amp;Category=R&amp;Reference=South+West">http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&amp;Category=R&amp;Reference=South+West</a> <a href="http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&amp;Category=C&amp;Reference=1016">http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&amp;Category=C&amp;Reference=1016</a>
<b>7</b>	Severn Estuary SSSI citation details. Natural England, Site of Special Scientific Interest [online] available: <a href="http://www.english-nature.org.uk/citation/citation_photo/1002284.pdf">http://www.english-nature.org.uk/citation/citation_photo/1002284.pdf</a>
<b>8</b>	River Wye SSSI citation details. Natural England, Site of Special Scientific Interest [online] available: <a href="http://www.english-nature.org.uk/citation/citation_photo/1006327.pdf">http://www.english-nature.org.uk/citation/citation_photo/1006327.pdf</a>
<b>9</b>	Natural England, National Nature Reserves [online available]: <a href="http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/regions/southwest.aspx">http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/regions/southwest.aspx</a>
<b>10</b>	Natural England, Local Nature Reserves [online] available: <a href="http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_results.asp?C=16">http://www.lnr.naturalengland.org.uk/Special/lnr/lnr_results.asp?C=16</a>
<b>11</b>	Local Record Centre Database [online] available: <a href="http://www.nbn-nfbr.org.uk/nfbr.php">http://www.nbn-nfbr.org.uk/nfbr.php</a>

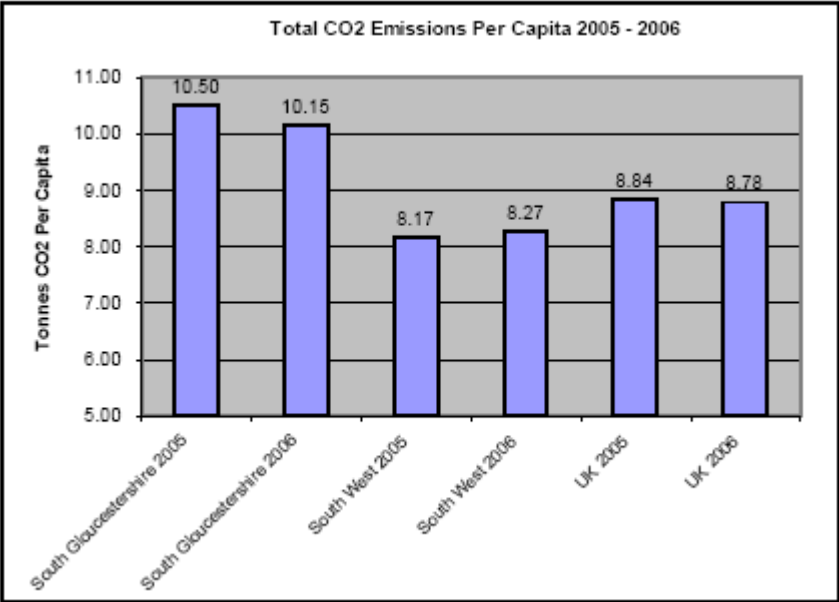
# Climate Change

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Climate Change</b>				
<p><b>South West England, Within The Wider Region (Precipitation and Temperature)</b></p>	<p>1,2,4</p>	<p>The following trends were reported by South Gloucestershire in the 2006 Core Strategy:</p> <ul style="list-style-type: none"> <li>• Predicted increase in average temperatures of 1.5 - 5.5°C over next 80 years in the South West region</li> <li>• Temperature rise to be accompanied by changing rainfall pattern - up to 30% increase in winter and up to 50% decrease in summer</li> <li>• Tidal level in Severn Estuary predicted to rise by 1 metre over next 100 years</li> </ul> <p>Events like the 2007 summer floods in Gloucestershire, though not specifically attributable to climate change, nevertheless provide a timely reminder of the region's vulnerability to extreme weather events.</p>	 <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
		<p>The trend in total precipitation resulting from intense weather events in the South West is slightly lower than the UK average.</p> <p>These “most intense events” can have proufound effects on:</p> <ul style="list-style-type: none"> <li>• Agriculture</li> <li>• Transport</li> <li>• Infrastructure</li> <li>• Electricity transmission systems</li> </ul> <p>Temperature, particularly in the West, show a greater sensitivity to the North Atlantic oceanic temperature variations and predominant Easterly winds. This pronounced sensitivity is particularly applicable to Oldbury.</p>		
<p><b>Greenhouse Gas Emissions</b></p>	<p>1,2,3</p>	<p>Data from the South West Observatory highlights the following:</p> <ul style="list-style-type: none"> <li>• 39% of the South West's emissions came from the industrial and commercial sector, 31% from the domestic sector, 28% from road transport and 2% from land use, land use change and forestry.</li> <li>• At a local authority level, South Gloucestershire had the highest emissions in the region in 2006.</li> </ul> <p>The table below shows carbon emisisions per capita. A total of 8.78 tonnes of CO<sub>2</sub> was emitted per resident in the UK.</p>		

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		<table border="1"> <thead> <tr> <th>REGION</th> <th>INDUSTRY AND COMMERCIAL</th> <th>DOMESTIC</th> <th>ROAD TRANSPORT</th> <th>LULUCF</th> <th>TOTAL</th> <th>POPULATION (MID-YEAR ESTIMATE)</th> <th>PER CAPITA EMISSIONS (T)</th> </tr> </thead> <tbody> <tr> <td>East</td> <td>16,902</td> <td>13,912</td> <td>13,966</td> <td>592</td> <td>45,372</td> <td>5,607</td> <td>8.09</td> </tr> <tr> <td>East Midlands</td> <td>18,350</td> <td>10,738</td> <td>11,305</td> <td>408</td> <td>40,800</td> <td>4,364</td> <td>9.35</td> </tr> <tr> <td>Greater London</td> <td>21,722</td> <td>16,969</td> <td>10,872</td> <td>51</td> <td>49,614</td> <td>7,513</td> <td>6.60</td> </tr> <tr> <td>North East</td> <td>21,391</td> <td>6,397</td> <td>4,862</td> <td>- 119</td> <td>32,532</td> <td>2,556</td> <td>12.73</td> </tr> <tr> <td>North West</td> <td>26,594</td> <td>17,289</td> <td>14,984</td> <td>589</td> <td>59,455</td> <td>6,853</td> <td>8.68</td> </tr> <tr> <td>Northern Ireland</td> <td>5,660</td> <td>6,181</td> <td>4,677</td> <td>- 173</td> <td>16,344</td> <td>1,742</td> <td>9.39</td> </tr> <tr> <td>Scotland</td> <td>22,199</td> <td>14,161</td> <td>11,255</td> <td>- 4,123</td> <td>43,493</td> <td>5,117</td> <td>8.50</td> </tr> <tr> <td>South East</td> <td>24,847</td> <td>21,044</td> <td>20,173</td> <td>- 31</td> <td>66,033</td> <td>8,238</td> <td>8.02</td> </tr> <tr> <td><b>South West</b></td> <td><b>16,691</b></td> <td><b>12,995</b></td> <td><b>11,791</b></td> <td><b>892</b></td> <td><b>42,369</b></td> <td><b>5,124</b></td> <td><b>8.27</b></td> </tr> <tr> <td><b>UK</b></td> <td><b>245,076</b></td> <td><b>153,605</b></td> <td><b>135,007</b></td> <td><b>- 1,953</b></td> <td><b>531,736</b></td> <td><b>60,588</b></td> <td><b>8.78</b></td> </tr> <tr> <td>Wales</td> <td>19,086</td> <td>7,707</td> <td>6,470</td> <td>- 332</td> <td>32,931</td> <td>2,966</td> <td>11.10</td> </tr> <tr> <td>West Midlands</td> <td>18,616</td> <td>13,140</td> <td>12,793</td> <td>350</td> <td>44,899</td> <td>5,367</td> <td>8.37</td> </tr> <tr> <td>Yorkshire &amp; the Humber</td> <td>28,097</td> <td>13,023</td> <td>11,860</td> <td>296</td> <td>53,276</td> <td>5,143</td> <td>10.36</td> </tr> </tbody> </table> <p>In the South West, a total of 8.27 tonnes were emitted per resident. This was almost 6% (0.51 tonnes) lower than the UK average and the 4th lowest recorded by a region.</p>		REGION	INDUSTRY AND COMMERCIAL	DOMESTIC	ROAD TRANSPORT	LULUCF	TOTAL	POPULATION (MID-YEAR ESTIMATE)	PER CAPITA EMISSIONS (T)	East	16,902	13,912	13,966	592	45,372	5,607	8.09	East Midlands	18,350	10,738	11,305	408	40,800	4,364	9.35	Greater London	21,722	16,969	10,872	51	49,614	7,513	6.60	North East	21,391	6,397	4,862	- 119	32,532	2,556	12.73	North West	26,594	17,289	14,984	589	59,455	6,853	8.68	Northern Ireland	5,660	6,181	4,677	- 173	16,344	1,742	9.39	Scotland	22,199	14,161	11,255	- 4,123	43,493	5,117	8.50	South East	24,847	21,044	20,173	- 31	66,033	8,238	8.02	<b>South West</b>	<b>16,691</b>	<b>12,995</b>	<b>11,791</b>	<b>892</b>	<b>42,369</b>	<b>5,124</b>	<b>8.27</b>	<b>UK</b>	<b>245,076</b>	<b>153,605</b>	<b>135,007</b>	<b>- 1,953</b>	<b>531,736</b>	<b>60,588</b>	<b>8.78</b>	Wales	19,086	7,707	6,470	- 332	32,931	2,966	11.10	West Midlands	18,616	13,140	12,793	350	44,899	5,367	8.37	Yorkshire & the Humber	28,097	13,023	11,860	296	53,276	5,143	10.36	
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<p><b>South Gloucestershire Local Authorities Greenhouse Gas Emissions</b></p>	<p>1</p>		<p>The graph below sets out tonnes CO<sub>2</sub> per capita in South Gloucestershire for 2005 and 2006, compared with the South West and UK averages. The emissions data includes domestic emissions, all industrial and commercial emissions, road transport (including motorway transport) and land use, land use change and forestry (reflecting the extent to which the land use cover of the local authority area comprises a net CO<sub>2</sub>source or sink).</p> <p>DEFRA's calculations of total emissions in South Gloucestershire was reported to be 2.60 million tonnes during 2005 and 2.58 million tonnes during 2006. This represents a per capita rate of emissions of 10.50 tonnes (2005) and 10.15 tonnes (2006), and a reduction in per capita emissions of 3.33% from 2005-6. Despite the decrease in per capital emissions from 2005-6, the per capita emissions rate in South</p>																																				

Indicator	Data Source	Current Data	Comparators	Trend														
		<p>Gloucestershire remains higher than the South West and UK averages, as illustrated below.</p>	 <p>The bar chart displays the following data:</p> <table border="1"> <thead> <tr> <th>Region/Year</th> <th>Tonnes CO2 Per Capita</th> </tr> </thead> <tbody> <tr> <td>South Gloucestershire 2005</td> <td>10.50</td> </tr> <tr> <td>South Gloucestershire 2006</td> <td>10.15</td> </tr> <tr> <td>South West 2005</td> <td>8.17</td> </tr> <tr> <td>South West 2006</td> <td>8.27</td> </tr> <tr> <td>UK 2005</td> <td>8.84</td> </tr> <tr> <td>UK 2006</td> <td>8.78</td> </tr> </tbody> </table>	Region/Year	Tonnes CO2 Per Capita	South Gloucestershire 2005	10.50	South Gloucestershire 2006	10.15	South West 2005	8.17	South West 2006	8.27	UK 2005	8.84	UK 2006	8.78	
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		<p>In 2006, the main sources of emissions in South Gloucestershire were:</p> <ul style="list-style-type: none"> <li>• Industry and Commerce 37%</li> <li>• Road Transport 34%</li> <li>• Home Energy Use 23%</li> <li>• Waste to Landfill 5%</li> <li>• Changes in Land Use 1%</li> </ul>																

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Energy</b>				
<b>Energy</b>	6,7,8	<p><u>Electricity Consumption 2007 (South Gloucestershire)</u>                      Overall: 1,553.4 GWh  <b>(0.5% of UK)</b>                      Average Domestic Consumption: 4,598 kWh                      Average Industrial Consumption: 147,643 kWh</p> <p><u>Total Energy Consumption 2006 (South Gloucestershire)</u>                      7,750.8 GWh</p>	<p><u>Electricity Consumption 2007 (South West England)</u>                      Overall: 26,267.1 GWh                      Average Domestic Consumption: 4,724 kWh                      Average Industrial Consumption: 62,751 kWh</p> <p><u>Electricity Consumption 2007 (Great Britain)</u>                      Overall: 309,669.5 GWh                      Average Domestic Consumption: 4,392 kWh                      Average Industrial Consumption: 79,077 kWh</p> <p><u>Total Energy Consumption 2006</u>                      South West England: 132,002.1 GWh                      UK: 2,120,261.5 GWh</p>	<p>South Gloucestershire constitutes to approximately 0.5% of Britain's electricity consumption.</p> <p>About 20% of the energy consumed in South Gloucestershire comes from electricity.</p> <p>The implementation of the actions in the ENERGY STRATEGY FOR GLOUCESTERSHIRE will:</p> <ul style="list-style-type: none"> <li>• Put Gloucestershire on the path to dramatically increase its current sustainable electricity generating capacity to reach a target of 40 MW by 2010 - retaining a greater part of the estimated £700m annual energy bill, of which over 98% currently leaves the local economy</li> <li>• Guide and encourage the County in using best practice to cut carbon emissions from energy use in all sectors</li> <li>• Enable every resident to have access to the basic energy services they need to have a good quality of life at an affordable price, reducing the high number of households that cannot afford to keep warm at a reasonable cost.</li> </ul>



Indicator	Data Source	Current Data	Comparators	Trend
<b>Renewable Energy</b>	6,8	<u>Energy Consumption from Renewable Sources 2006 (South Gloucestershire)</u> 8.1 GWh (0.1%)	<u>Total Energy Consumption from Renewable Sources 2006</u> South West England: 449.3 GWh (0.02%) UK: 6,939.5 GWh (0.3%)	<p>The South West Regional Development Agency (SWRDA) has published the Regional Renewable Energy Strategy, setting targets of 11-15% energy generated by renewable resources by 2010.</p> <p>Gloucestershire has around 9 MW of installed renewable electricity capacity at present, making it the county with the lowest sustainable energy generation in the South West. A further 30- 40 MW of new capacity is needed to meet the County's 2010 target.</p>
<b>Current Capacity</b>	9	<p>The existing nuclear power station at Oldbury has a capacity of 434 MW. It is currently being decommissioned (due to be completed by 2010).</p> <p>Power stations in the vicinity of the site include:</p> <ul style="list-style-type: none"> <li>• Seabank Power Station: CCGT, 1,145 MW, 16 km</li> <li>• Uskmouth B Power Station: coal, 393 MW, 32 km</li> <li>• Barry Power Station: gas, 230 MW, 56 km</li> <li>• Hinkley Point B Power Station: Nuclear, 1,250 MW, 64 km</li> <li>• Aberthaw Power Station: coal, 1,455 MW, 80 km</li> <li>• Baglan Bay power station: gas, 525 MW, 96 km</li> </ul>		

## Key to Data Sources

1	South Gloucestershire Core Strategy – Issues and Options Consultation <a href="https://consultations.southglos.gov.uk/inovem/consult.ti/CSissuesandoptions/viewCompoundDoc?docid=109780&amp;sessionid=&amp;voteid=&amp;partId=109812">https://consultations.southglos.gov.uk/inovem/consult.ti/CSissuesandoptions/viewCompoundDoc?docid=109780&amp;sessionid=&amp;voteid=&amp;partId=109812</a>
2	United Kingdom Climate Impact Programme UKCIP02 [online] available <a href="http://www.ukcip.org.uk/images/stories/Pub_pdfs/UKCIP02_tech.pdf">http://www.ukcip.org.uk/images/stories/Pub_pdfs/UKCIP02_tech.pdf</a> [accessed 6th March 2009]
3	South West Observatory – Carbon Dioxide Emissions. <a href="http://www.swenvo.org.uk/environment/carbon_dioxide.asp">http://www.swenvo.org.uk/environment/carbon_dioxide.asp</a> [accessed 6 <sup>th</sup> March 2009]
4	South West Action to Adapt to Climate Change <a href="http://www.southwest-ra.gov.uk/media/SWRA/Climate%20Change/Climate_Change_Action_Plan.pdf">http://www.southwest-ra.gov.uk/media/SWRA/Climate%20Change/Climate_Change_Action_Plan.pdf</a>
5	Gloucestershire County Council- Gloucestershire Energy Strategy [date of publishing to be confirmed] <a href="http://www.gloucestershire.gov.uk/index.cfm?articleid=1133">http://www.gloucestershire.gov.uk/index.cfm?articleid=1133</a>
6	Gloucester First, The Energy Strategy for Gloucestershire <a href="http://www.glosfirst.co.uk/docs/Energy%20Strategy%20Executive%20Summary%20April%2007.pdf">http://www.glosfirst.co.uk/docs/Energy%20Strategy%20Executive%20Summary%20April%2007.pdf</a>
7	Department of Business Enterprise and Regulatory Reform, Electricity Consumption Data at Regional and Local Authority Level [online] available: <a href="http://www.berr.gov.uk/energy/statistics/regional/regional-local-electricity/page36213.html">http://www.berr.gov.uk/energy/statistics/regional/regional-local-electricity/page36213.html</a>
8	Department of Business Enterprise and Regulatory Reform, Total final energy consumption at regional and local authority level [online] available: <a href="http://www.berr.gov.uk/energy/statistics/regional/total-final/page36187.html">http://www.berr.gov.uk/energy/statistics/regional/total-final/page36187.html</a>
9	Department of Business Enterprise and Regulatory Reform, Nuclear Power Stations [online] available: <a href="http://www.berr.gov.uk/energy/sources/nuclear/key-issues/power-stations/page47765.html/sources/nuclear/key-issues/power-stations/page47765.html">http://www.berr.gov.uk/energy/sources/nuclear/key-issues/power-stations/page47765.html/sources/nuclear/key-issues/power-stations/page47765.html</a>
10	Wikipedia, Power Stations in South West England [online] available: <a href="http://en.wikipedia.org/wiki/Category:Power_stations_in_South_West_England">http://en.wikipedia.org/wiki/Category:Power_stations_in_South_West_England</a>

## Communities: Population and Economy

Indicator	Data Source	Current Data			Comparators	Trend	
<b>Topic: Population</b>							
<b>Age of population</b>	1, 2, 4		<b>Oldbury-on-Severn</b>	<b>South Gloucestershire (Unitary Authority)</b>	<b>South West of England</b>	<b>England</b>	<p>The population in the South West has steadily increased over the past 30 years and now has approximately 5.1 million residents (2006). This was 181,000 more compared with mid-2001 and an increase of 17% since 1981. According to the Office for National Statistics, the region's population grew faster than any other region between 1981 and 2006 at 16.9%, almost entirely due to migration, mainly from London and the South East. The largest percentage change was a 36% increase in North Dorset.<sup>2</sup></p> <p>For Gloucestershire<sup>4</sup>, the 2006 mid-year population estimates produced by the National Statistics put the county population at a total of 578,631 people, a rise of 42,649 people or 8.0% since 1991. The growth was above the average of 5.8% for England and Wales.</p> <p>For the 10 year period 1997 to 2006, the county population saw an overall upward trend, increased by an average of 0.5% or 2,635 people a year since 1997. The population of Gloucestershire grew by 0.6% between 2005 and 2006, showing a slight increase on the longer term trend.</p>
		All People (Count)	1,521*	245,641	4,928,434	49,138,831	
		People aged 0-4 (%)		6.21	5.48	5.96	
		People aged 5-7 (%)		4.04	3.51	3.74	
		People aged 8-9 (%)		2.69	2.45	2.61	
		People aged 10-14 (%)		6.64	6.37	6.57	
		People aged 15 (%)		1.21	1.23	1.27	
		People aged 16-17 (%)		2.43	2.41	2.51	
		People aged 18-19 (%)		2.15	2.31	2.40	
		People aged 20-24 (%)		5.03	5.36	6.01	
		People aged 25-29 (%)		6.34	5.73	6.65	
		People aged 30-44 (%)		24.26	21.29	22.65	
		People aged 45-59 (%)		19.67	19.93	18.88	
		People aged 60-64 (%)		4.96	5.28	4.87	
		People aged 65-74 (%)		8.06	9.41	8.35	

Indicator	Data Source	Current Data			Comparators		Trend
		People aged 75-84 (%)		4.76	6.75	5.60	
		People aged 85-89 (%)		1.04	1.65	1.30	
		People aged 90 and over (%)		0.52	0.85	0.64	
		Mean age of population in the area		38.13	40.60	38.60	
		Median age of population in the area		37.00	40.00	37.00	
<p>* Percentage data not available. People Count value derived by aggregating data supplied using the Neighbourhood Statistics Geography Hierarchy.</p> <p>The population average of South Gloucestershire is similar to the national average which is lower than the regional average.</p> <p>People aged 65 and older make up approximately 14% of the South Gloucestershire population this is just below the national average.</p>							
<b>Topic: Employment</b>							
<b>Percentage Economically Active – Employed %</b>	1, 2	<b>Olbury-on-Severn</b>	<b>South Gloucestershire (Unitary Authority)</b>	<b>South West of England</b>	<b>England</b>		In the second quarter of 2007 the employment rate (for people of working age) in the South West was 78%, among the highest in the UK where the overall rate was 74%. <sup>2</sup> Full time employment levels at district level are higher (c.5%) than the regional and national average. Part time employment levels are also higher than both the regional and national levels.
		<b>Full Time</b>	46.29	39.08	40.81		
		<b>Part Time</b>	14.62	13.23	11.81		

Indicator	Data Source	Current Data		Comparators		Trend
<b>Percentage Economically Active – unemployed %<sup>1</sup></b>			1.81	2.57	3.35	Unemployment levels at district level are below both the regional and national levels.
<b>Industry of employment</b>		<b>Oldbury-on-Severn 100% (2,984)</b>	<b>South Gloucestershire (Unitary Authority) 100% (55,906)</b>	<b>South West of England 100% (2,900,020)</b>	<b>England 100% (22,441,498)</b>	
<b>All persons</b>						
Agriculture/Forestry (%)		0.70	2.17	1.22	1.45	
Fishing (%)		0.10	0.03	0.01	0.02	
Mining (%)		0.17	0.38	0.16	0.25	
Manufacturing (%)		12.16	11.29	16.89	14.83	
Electricity/Gas/Water Supply (%)		2.82	2.45	0.77	0.71	
Construction (%)		6.87	6.71	6.49	6.76	
Wholesale/Retail Trade (%)		20.38	16.75	17.82	16.85	
Hotels/Restaurant (%)		8.58	6.72	5.13	4.73	
Transport/Communications (%)		6.90	6.53	6.79	7.09	
Financial (%)		2.95	2.52	3.77	4.80	
Real Estate (%)		7.17	7.78	10.80	13.21	
Public Admin (%)		4.05	5.69	5.68	5.66	

Indicator	Data Source	Current Data		Comparators		Trend
Education (%)		7.61	11.44	7.95	7.74	
Health and Social Work (%)		13.51	14.20	11.97	10.70	
Other (%)		6.03	5.35	4.54	5.20	
Self Employed (%)			7.99	10.08	8.32	
<b>Socio-Economic Classifications 2001 (% Persons aged 16-74)</b>		<b>Oldbury-on-Severn</b>	<b>South Gloucestershire</b>	<b>South West of England</b>	<b>England</b>	
Large employers and higher managerial occupations	1.15	1.97	2.86	3.50		
Higher professional occupations	1.75	4.18	4.17	5.11		
Lower managerial and professional occupations		13.41	15.81	16.78	18.73	
Semi-routine occupations		15.89	11.66	12.17	11.65	
Routine occupations		11.17	8.88	9.82	9.02	
Never Worked		2.93	2.11	3.13	2.72	
Full-time students		6.66	13.41	6.97	7.03	

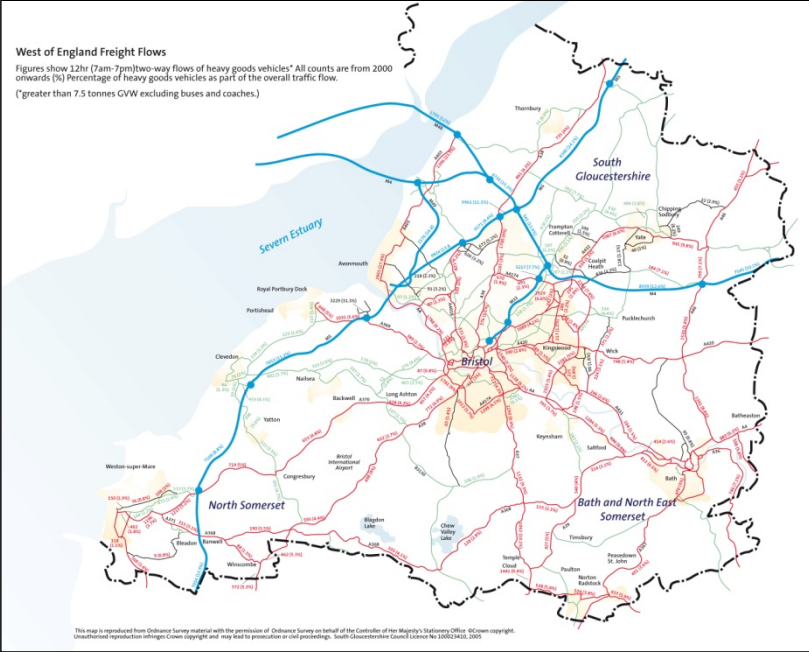
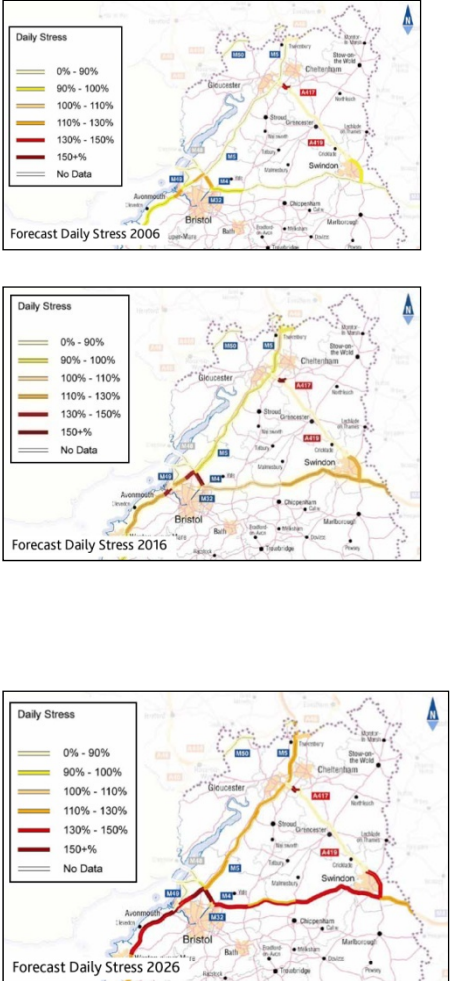
### Key to Data Sources

1	National Statistics 2001, Neighbourhood Statistics: Quantock Vale [online] available: <a href="http://www.neighbourhood.statistics.gov.uk/dissemination/LeadDatasetList.do?a=7&amp;b=545988&amp;c=Oldbury-on-severn&amp;d=14&amp;g=400840&amp;i=1001x1003&amp;m=0&amp;r=1&amp;s=1236087078215&amp;enc=1&amp;domainId=15">http://www.neighbourhood.statistics.gov.uk/dissemination/LeadDatasetList.do?a=7&amp;b=545988&amp;c=Oldbury-on-severn&amp;d=14&amp;g=400840&amp;i=1001x1003&amp;m=0&amp;r=1&amp;s=1236087078215&amp;enc=1&amp;domainId=15</a>
2	<a href="http://www.statistics.gov.uk/cci/nugget.asp?id=1134">http://www.statistics.gov.uk/cci/nugget.asp?id=1134</a>
3	South Gloucestershire Primary Care Trust Annual Public Health Report 2007-2008 [online] available: <a href="http://www.sglos-pct.nhs.uk/publications/Annual%20Report%202007%20-08.pdf">http://www.sglos-pct.nhs.uk/publications/Annual%20Report%202007%20-08.pdf</a>
4	Gloucestershire County Council – Gloucestershire Population Monitor 2006 <a href="http://www.gloucestershire.gov.uk/index.cfm?articleid=10868">http://www.gloucestershire.gov.uk/index.cfm?articleid=10868</a>

## Communities: Supporting Infrastructure

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Transport</b>				
<b>Regional Freight Routes</b>	1,2	<p>South Gloucestershire is crossed by north to south strategic transport corridors, en route to Somerset, Devon and Cornwall, and east to west, en route to South Wales. The main corridors are:</p> <p><b>Road</b></p> <ul style="list-style-type: none"> <li>• M5 (Birmingham to Exeter);</li> <li>• M4 (London to South Wales) and</li> <li>• A38 (Lincoln to Exeter).</li> </ul> <p><b>Rail</b></p> <ul style="list-style-type: none"> <li>• London to Exeter main line;</li> <li>• London to South Wales main line;</li> <li>• Bristol to Gloucester and the Midlands/North; and</li> <li>• Freight line to Tytherington Quarry.</li> </ul> <p>The <b>county road network</b> may be characterised as:</p> <ul style="list-style-type: none"> <li>• Unreliable journey times;</li> <li>• Low overall journey speed;</li> <li>• Environmental impact upon roadside communities; and</li> <li>• Variable standard of highway provision.</li> </ul>		



Indicator	Data Source	Current Data	Comparators	Trend
		<p><b>West of England Freight Flows</b>                      Figures show 12hr (7am-7pm) two-way flows of heavy goods vehicles* All counts are from 2000 onwards (%) Percentage of heavy goods vehicles as part of the overall traffic flow. (*greater than 7.5 tonnes GVW excluding buses and coaches.)</p>  <p><small>This map is reproduced from Oldbury Survey material with the permission of Oldbury Survey on behalf of the Controller of Her Majesty's Stationery Office. © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. South Gloucestershire Council Licence No 100224105, 2005</small></p>	 <p>Forecast Daily Stress 2006</p> <p>Forecast Daily Stress 2016</p> <p>Forecast Daily Stress 2026</p>	

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Waste</b>				
<b>Municipal Waste</b>	3,4,5	<p>In 2006/2007 South Gloucestershire County Council was ranked 5<sup>th</sup> out of the 80 Unitary Authorities for recycling and composting 39.54% of household waste.</p> <p>Landfill remains the principal method of waste disposal in South Gloucestershire. A total of 84,711 tonnes (57%) of municipal waste was sent to landfill in the region in 2006/2007, this almost equates to the English average of 58%. There are currently three operational landfill sites within the South Gloucestershire County Council area. No information regarding capacity of these sites has been identified. No hazardous waste landfill sites are operational in the West of England region, however a number of specialist waste management contractors operate in the region and provide services to deal with a range of hazardous wastes.</p> <p>Planning and development of waste infrastructure within the region are dealt with through the West of England Waste Management and Planning Partnership. There are currently no waste treatment facilities operational in the region, however a three partner group within the region (Bristol, North Somerset and South Gloucestershire) are exploring options related to the procurement of waste treatment facilities in the future.</p>		<p>Total municipal waste in the region has increased by just under 11% since 2005-2006, from 124,989 tonnes to 149,155 tonnes in 2006/2007.</p> <p>Total household waste continues to decrease in the region and is almost 21% lower in 2006/2007 than in 2005/2006, decreasing from 104,679 tonnes 82,870 tonnes.</p>
<b>Radioactive and Hazardous Waste</b>	6	<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	West of England Partnership (2006). Final Joint Local Transport Plan 2006/07 - 2010/11. Freight Supporting Statement.
2	Highways Agency (2008). Regional Network Report for the South West.
3	Department for Environment, Food and Rural Affairs. Municipal Waste Management Statistics [online] available: <a href="http://www.defra.gov.uk/environment/statistics/wastats/bulletin07.htm">http://www.defra.gov.uk/environment/statistics/wastats/bulletin07.htm</a> [accessed 03 March 2009]
4	South Gloucestershire Council – Sites Licensed under the EPA [available online]: <a href="http://www.southglos.gov.uk/NR/exeres/96467823-c33a-4de2-953d-776f6d814d40">http://www.southglos.gov.uk/NR/exeres/96467823-c33a-4de2-953d-776f6d814d40</a> [accessed 11 March 2009]
5	West of England Waste Management and Planning Partnership – Joint Residual Waste Management Strategy, Summary Version, 2008 [available online]: <a href="http://www.rubbishresource.co.uk/2007/index.php?option=com_content&amp;task=section&amp;id=20&amp;Itemid=67">http://www.rubbishresource.co.uk/2007/index.php?option=com_content&amp;task=section&amp;id=20&amp;Itemid=67</a>
6	South West Regional Development Agency. Draft Regional Spatial Strategy for the South West 2006-2026 [online] available: <a href="http://www.southwest-ra.gov.uk/nqcontent.cfm?a_id=836">http://www.southwest-ra.gov.uk/nqcontent.cfm?a_id=836</a>

## Human Health and Well-Being

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Human Health &amp; Well-Being</b>				
<b>Community well-being</b>	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, South Gloucestershire 004C to England as a whole as follows:</p> <ul style="list-style-type: none"> <li>• Income deprivation much less than average.</li> <li>• Employment deprivation much less than average.</li> <li>• Health deprivation much less than average.</li> <li>• Education deprivation much less than average.</li> <li>• Barriers to housing and services are much greater than average.</li> <li>• Crime is much less than average.</li> <li>• Living environment deprivation is greater than average.</li> </ul>		
<b>Index of multiple deprivation</b>	2	The Department of Communities and Local Government's index of deprivation (an index combining a	Other borough and district councils in Gloucestershire are ranked as follows:	

Indicator	Data Source	Current Data	Comparators	Trend																				
<b>n (2007)</b>		range of economic, social and housing issues into a single deprivation score) shows South Gloucestershire Council's area ranked as 308 out of 354 (where 1 is most deprived). This ranking shows that the South Gloucestershire is not a particularly deprived area.	<ul style="list-style-type: none"> <li>• Cheltenham BC is 202</li> <li>• Cotswold DC is 298</li> <li>• Forest of Dean DC is 201</li> <li>• Stroud DC is 280</li> <li>• Tewkesbury BC is 279</li> </ul> <p>As can be seen from the above, all of the borough and district council areas in Gloucestershire are ranked as 'not deprived' in common with South Gloucestershire.</p>																					
<b>Age profile (mid 2006)</b>	1	<p>In the Super Output Area, South Gloucestershire 004C the age profile of the population is as follows:</p> <table border="1" data-bbox="546 810 969 1002"> <thead> <tr> <th>Age Band (years)</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>0 – 15</td> <td>17.5</td> </tr> <tr> <td>16 – 64 (males)</td> <td rowspan="2">58.5</td> </tr> <tr> <td>16 – 59 (females)</td> </tr> <tr> <td>65+ (males)</td> <td rowspan="2">24.0</td> </tr> <tr> <td>60+ (females)</td> </tr> </tbody> </table>	Age Band (years)	Percentage	0 – 15	17.5	16 – 64 (males)	58.5	16 – 59 (females)	65+ (males)	24.0	60+ (females)	<p>These figures compare to the age profile for the UK as a whole in 2006 as follows:</p> <table border="1" data-bbox="983 746 1507 938"> <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 higher proportion of people in the upper age bracket (retired or approaching retirement) in the Super Output Area, South Gloucestershire 004C than in the UK as a whole. There are also proportionately fewer people of working age in the area, therefore.</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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Indicator	Data Source	Current Data	Comparators	Trend												
<b>General health (2001)</b>	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, South Gloucestershire 004C were as follows:</p> <ul style="list-style-type: none"> <li>• Good – 77.0%</li> <li>• Fairly good – 18.1%</li> <li>• Not good – 4.9%</li> </ul>	<p>For comparison purposes, the same data for the overall South Gloucestershire area and England are as below:</p> <table border="1"> <thead> <tr> <th></th> <th>South Gos.</th> <th>England</th> </tr> </thead> <tbody> <tr> <td>Good</td> <td>72.4</td> <td>68.8</td> </tr> <tr> <td>Fairly good</td> <td>20.6</td> <td>22.2</td> </tr> <tr> <td>Not good</td> <td>7.0</td> <td>9.0</td> </tr> </tbody> </table> <p>As can be seen from the figures, people in the Super Output Area, South Gloucestershire 004C report a higher percentage of good health than those in both the overall South Gloucestershire Council area and in England as a whole.</p>		South Gos.	England	Good	72.4	68.8	Fairly good	20.6	22.2	Not good	7.0	9.0	
	South Gos.	England														
Good	72.4	68.8														
Fairly good	20.6	22.2														
Not good	7.0	9.0														
<b>Life expectancy at birth (Jan 04 – Dec 06)</b>	1	<table border="1"> <thead> <tr> <th></th> <th>South Gos.</th> <th>SW of England</th> <th>England</th> </tr> </thead> <tbody> <tr> <td>Males</td> <td>79.30</td> <td>78.50</td> <td>77.32</td> </tr> <tr> <td>Females</td> <td>83.60</td> <td>82.70</td> <td>81.55</td> </tr> </tbody> </table>		South Gos.	SW of England	England	Males	79.30	78.50	77.32	Females	83.60	82.70	81.55	<p>As can be seen from above, the life expectancy in the South Gloucestershire Council area is good with ages slightly above the national average for England.</p>	Data from the same source for previous years show that these figures for life expectancy at birth in the South Gloucestershire Council area have risen slightly for both males and females since January 2001.
	South Gos.	SW of England	England													
Males	79.30	78.50	77.32													
Females	83.60	82.70	81.55													
<b>Infant mortality (Jan 03 – Dec 05)</b>	1	<p>Infant mortality in the South Gloucestershire Council area for the years in question was 3.4 persons in every 1000.</p>	<p>This shows that infant mortality in South Gloucestershire is low compared to the figures of 4.4 persons per thousand for the South-west of England region and 5.1 persons per thousand in England as a whole.</p>	Data from the same source for previous years show that figures for infant mortality in the South Gloucestershire Council area have declined slightly from a high in 1999-2001 but are similar to the numbers observed between 1998 and 2000.												

Indicator	Data Source	Current Data	Comparators	Trend
<b>Proximity to medical services</b>	3	<p>Medical services in the area of the site are as follows:</p> <ul style="list-style-type: none"> <li>• There are no General Practitioner (GP) practices within 5 km of the site. There are, however, seven GP practices within 10 km of the site</li> <li>• Closest hospital is the Elms Day Hospital (5.1 km) but this has no Accident and Emergency department</li> <li>• Nearest hospital with an Accident and Emergency department is Frenchay Hospital in Frenchay Park Road, Bristol which is 16.9 km away</li> <li>• The nearest hospital providing mental health services is Elms Day Hospital which is 5.1 km away</li> </ul>		
<b>Education - examination results for young people (2006 – 07)</b>	1	<p>In the Super Output Area, South Gloucestershire 004C, 54% of pupils achieved 5 or more A*- C grade passes including English and Mathematics at GCSE or equivalent.</p>	<p>This compares to the figure of 48% of students for the South Gloucestershire Council area and 46% of students for England as a whole.</p>	
<b>Housing – total unfit dwellings (Apr 06)</b>	1	<p>No published data could be found for this parameter for the South Gloucestershire Council area, however, the total percentage of unfit dwellings in the South-west of England region is 3.8%.</p>	<p>This compares to a percentage of 4.2% for England as a whole.</p>	

Indicator	Data Source	Current Data	Comparators	Trend
<b>Radioactivity monitoring</b>	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"> <li>• water, sediment, beach and terrestrial and marine food and animal samples were collected from around site in 2007;</li> <li>• analysis of tritium, carbon-14 and sulphur-35 in milk, crops and fruit all showed zero to very low levels of sulphur-35 and carbon-14;</li> <li>• concentrations of radioactivity in freshwater were less than the World Health Organisation’s screening level for drinking water;</li> <li>• relatively high concentrations of tritium were detected in fish and shellfish but these were assigned to a local source unconnected with nuclear power plants;</li> <li>• concentrations of certain artificial radionuclides in seafood, sediment, sand and seawater were elevated and represent the</li> </ul>	<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 Oldbury sampling were as follows:</p> <ul style="list-style-type: none"> <li>• estimated dose from locally grown foodstuffs was less than 0.005 mSv;</li> <li>• estimated dose to local fish and shellfish consumers was 0.018 mSv;</li> <li>• the total dose from all sources, including direct radiation, was assessed as being 0.061 mSv.</li> </ul>	<p>Trends in the data noted from sampling in previous years are as follows:</p> <ul style="list-style-type: none"> <li>• no change in estimated dose from locally grown foodstuffs was observed from the less than 0.005 mSv value recorded in 2006;</li> <li>• a small increase in estimated dose to local fish and shellfish consumers was observed from the 0.012 mSv value recorded in 2006.</li> </ul>



Indicator	Data Source	Current Data	Comparators	Trend
		<p>combined effect of a number of different radioactive sources in the area and elsewhere.</p>		
<p><b>Health related to nuclear installations</b></p>	<p>5</p>	<p>There has been, since 1965, a nuclear power station operating on the Sizewell site. 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 Sizewell are as below:</p> <ul style="list-style-type: none"> <li>• actual cases of childhood leukaemia and non-Hodgkin lymphoma between 1969 and 1993 in a 25km area around the plant were 177.</li> <li>• actual cases of childhood solid tumours between 1969 and 1993 in a 25km area around the plant were 252.</li> </ul>	<p>For comparison purposes, the figures derived using statistics for Britain as a whole are as follows:</p> <ul style="list-style-type: none"> <li>• 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 170.19.</li> <li>• the expected number of cases of childhood tumours between 1969 and 1993 in a 25km area around the plant should have been 263.54.</li> </ul> <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>	

## Key to Data Sources

1	Office of National Statistics on the web at: <a href="http://neighbourhood.statistics.gov.uk/dissemination/home.do;jessionid=ac1f930c30d607c6170cbe3146ada704c9cac1978fc7?m=0&amp;s=1236174480737&amp;enc=1&amp;bhcp=1&amp;nsjs=true&amp;nsck=true&amp;nssvg=false&amp;nswid=996">http://neighbourhood.statistics.gov.uk/dissemination/home.do;jessionid=ac1f930c30d607c6170cbe3146ada704c9cac1978fc7?m=0&amp;s=1236174480737&amp;enc=1&amp;bhcp=1&amp;nsjs=true&amp;nsck=true&amp;nssvg=false&amp;nswid=996</a>
2	Department of Communities and Local Government, Indices of Deprivation on the web at: <a href="http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/">http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/</a>
3	NHS 'Find Services'. <a href="http://www.nhs.uk/servicedirectories/Pages/ServiceSearch.aspx">http://www.nhs.uk/servicedirectories/Pages/ServiceSearch.aspx</a>
4	Food Standards Agency (2007). Radioactivity In Food and the Environment (RIFE 13) report. <a href="http://www.food.gov.uk/science/surveillance/radiosurv/rife13">http://www.food.gov.uk/science/surveillance/radiosurv/rife13</a>
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. <a href="http://www.comare.org.uk/comare_docs.htm">http://www.comare.org.uk/comare_docs.htm</a>

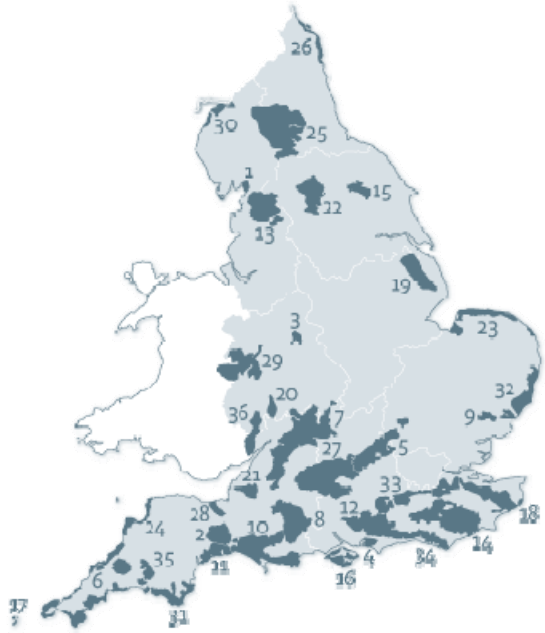
## Cultural Heritage

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Cultural Heritage</b>				
<b>Scheduled Monuments</b>	1	There are 4 Scheduled Monuments within 5km of the existing nuclear power stations, the closest of which is Oldbury Camp c.1.4km to the south.		
<b>Registered Paks and Gardens</b>	1	There is 1 registered Park and Garden (Thornbury Castle) within 5km of the existing nuclear power station and this is located c.4.3km to the south-east.		
<b>Conservation Areas</b>	2	There is 1 Conservation Area (Thornbury) within 5km of the existing nuclear power stations and this is located c.4.2km to the south-east.		
<b>Listed Buildings</b>	3	There are 15 listed buildings within c.2km of the existing nuclear power stations, although none lie directly adjacent. There are 250 listed buildings within c.5km. The power station itself is a locally-listed building.		
<b>Potential historic landscape</b>	4	There is an area of potential historic landscape north, east and south of the existing nuclear power stations where the same field boundaries are shown on 19 <sup>th</sup> century Ordnance Survey mapping. Medieval ridge and furrow has also been observed in the vicinity.		
<b>Archaeologic al sites</b>	3	Archaeological sites of Prehistoric, Roman and later date have been located within the Oldbury Upon Severn area and the potential exists for others to be present within the site. Layers of palaeo-environmental potential may also be present.		

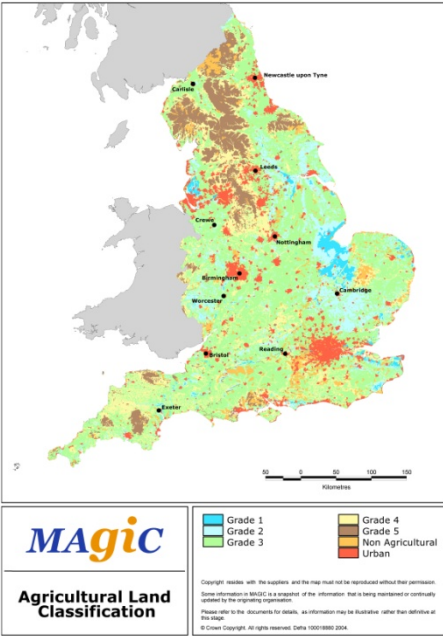
### Key to Data Sources

1	<a href="http://www.magic.gov.uk">http://www.magic.gov.uk</a> Accessed 5.3.2009
2	South Gloucestershire Council Local Plan [online], available: <a href="http://www.southglos.gov.uk">http://www.southglos.gov.uk</a> Accessed 5.3.2009
3	<a href="http://www.heritagegateway.org.uk">http://www.heritagegateway.org.uk</a> Accessed 5.3.2009
4	First Edition Ordnance Survey

## Landscape

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Landscape</b>				
<b>Areas of Outstanding Natural Beauty</b>	1	 <p data-bbox="548 1161 1944 1222">Map showing all Area of Outstanding Natural Beauty (AONB). Wye Valley (number 36) is located 7 km to the west and Cotswolds (number 7) is 13km to the east. The Mendips ( number 21) is located over 30 km to the south.</p>		
<b>Key to Data Sources</b>				
1	Natural England – Areas of Outstanding Natural Beauty <a href="http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/aonb/default.aspx">http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/aonb/default.aspx</a> [accessed 13 February 2009]			

## Soils, Geology and Land use

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Soils</b>				
<b>Agricultural Land Classification</b>	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> <p>The site is within a Agri-environmental scheme area as designated by Natural England.</p> <p>National Soils Research Institute (Report available)</p> <ul style="list-style-type: none"> <li>• Newchurch Soils</li> <li>• Deep stoneless mainly calcareous clayey soils</li> <li>• Marine alluvium</li> <li>• Soils seasonally waterlogged by fluctuating groundwater and with relatively slow lateral saturated conductivity</li> <li>• Permanent grassland with winter cereals in Somerset and Avon; cereals, sugar beet, potatoes and field vegetables</li> </ul>		
<b>Soils</b>				
				
<b>Topic: Geology</b>				
<b>Geological SSSIs</b>	3	There is no geological SSSI's within the local vicinity		
<b>Geology and Land Quality</b>	2	Envirocheck Report (Report available)		

Indicator	Data Source	Current Data	Comparators	Trend
		<ul style="list-style-type: none"> <li>• Geological Risks The local Geology is Tidal Flat Deposits underlain by Mercia Mudstone Group.</li>   <li>No mineral abstraction has been recorded locally</li>   <li>Based on the information within the Envirocheck report the geological risks are;                             <ul style="list-style-type: none"> <li>• Moderate risk for the Potential for Compressible Ground Stability Hazards</li> <li>• Very low risk for the Potential for Landslide Ground Stability Hazards</li> <li>• Moderate risk for the Potential for Running Sand Ground Stability Hazards</li> <li>• Low risk for the Potential for Shrinking or Swelling Clay Ground Stability Hazards</li> </ul> </li>   <li>• Environmental Hazards Based on the Envirocheck report the main environmental Hazards are;                             <ul style="list-style-type: none"> <li>• Three historical landfills are noted within the local vicinity that are recorded as being related to the historic power station These site lie to both to the north and south of the site. No detailed information is recorded about waste/types volumes deposited however there footprint seems extensive.</li> <li>• There are two waste management licences related to the existing power station.</li> </ul> </li>   <li>• Historic Land Use</li> </ul>		

Indicator	Data Source	Current Data	Comparators	Trend
		<ul style="list-style-type: none"> <li>Historic maps ranging from the 1880's to current were studied. No previous industrial use was noted within the area prior to the existing power station.</li> </ul>		

### Key to Data Sources

1	National Soils Research Institute Report 27374527 – (Report available on request). Purchased 3 <sup>rd</sup> March 2009
2	Envirocheck Report 27374527_1 – (Report available on Request) Purchased 2 <sup>nd</sup> March 2009
3	Natural England Nature on the Map web site accessed on the 05 <sup>th</sup> March 2009-03-05 <a href="http://www.natureonthemap.org.uk/map.aspx?m=nreserves">http://www.natureonthemap.org.uk/map.aspx?m=nreserves</a>

## Water Quality and Resources

Indicator	Data Source	Current Data	Comparators	Trend
<b>Topic: Water</b>				
<b>Current State of the Waters in the Severn River Basin District</b>	1, 2,3	<p>In the Severn River Basin District (RBD), 14% of rivers (by length) (or 19% of assessed water bodies) meet the requirements for good ecological status. The majority of the water bodies at less than good ecological status (60%) are at moderate ecological status. In most cases river water bodies are at less than good because of a single pressure, with fish and phosphorus the most common failing elements. A greater number of groundwater bodies (70% of assessed water bodies) meet the requirements for good status. Only 19% of the assessed lakes meet the requirements for good ecological status or good potential. Thirty six of the 820 surface water bodies in the RBD are designated as artificial, and 140 are designated as heavily modified.</p> <p>The draft Severn River Basin Management Plan (dRBMP) has set a target to increase the number of water bodies achieving good ecological status in the RBD to 18% by 2015, and just less than 60% by 2021.</p> <p>The Oldbury site is located in the Bristol Avon and North Somerset Stream catchment. Major discharges in the catchment are from sewage treatment works which can, at times, result in nutrient enrichment at times of low flows in the Axe and North Somerset Streams. Currently 144km (18%) of river length assessed (294km – 27% of river length has not been assessed) in this catchment is achieving good ecological status or potential. The pressures most commonly preventing good ecological status are phosphorus, fish and dissolved oxygen. Of the 6 lake water bodies in the catchment, one is at good ecological potential and the other five have yet to be assessed.</p> <p>The Severn dRBMP has set a target to increase the length of river achieving good ecological status in the Bristol Avon and North Somerset Streams to 154km (19%) by 2015. The measures proposed will reduce phosphorus in 73km of rivers, and improve dissolved oxygen levels in 37km. Fish populations will improve in nearly 7km of river.</p>		



Indicator	Data Source	Current Data	Comparators		Trend																																																		
		<p>The Severn Estuary is internationally recognised for nature conservation being designated as a Special Protection Area (SPA), Ramsar site and Special Area of Conservation (SAC). The estuary has a high tidal range and presents a challenge for coastal and flood protection. The upper, middle and lower Severn Estuary are candidates for designation as heavily modified water bodies due to modifications for flood protection. Some actions have been identified in the dRBMP to mitigate the impacts of these modifications on ecology.</p> <p>Local information for the area around Oldbury from the Environment Agency (EA) web site relevant to Water Framework Directive (WFD) is summarised below:</p> <table border="1"> <thead> <tr> <th rowspan="2">Sector</th> <th colspan="2">Ecological quality</th> <th colspan="2">Chemical quality</th> </tr> <tr> <th>Current</th> <th>Predicted 2015</th> <th>Current</th> <th>Predicted 2015</th> </tr> </thead> <tbody> <tr> <td>Rivers: Oldbury Naite Rhine (cHMWB)<sup>1</sup></td> <td>Not Assessed</td> <td>Not Assessed</td> <td>Not Assessed</td> <td>Not Assessed</td> </tr> <tr> <td></td> <th colspan="2">Quantitative quality</th> <th colspan="2">Chemical quality</th> </tr> <tr> <td></td> <th>Current</th> <th>Predicted 2015</th> <th>Current</th> <th>Predicted 2015</th> </tr> <tr> <td>Groundwater: Avonmouth Mercia Mudstone</td> <td>Good</td> <td>Good</td> <td>Good</td> <td>Good</td> </tr> <tr> <td></td> <th colspan="2">Ecological quality</th> <th colspan="2">Chemical quality</th> </tr> <tr> <td>Lakes</td> <td>None present</td> <td>None present</td> <td>None present</td> <td>None present</td> </tr> <tr> <td>Estuarine (cHMWB)<sup>8</sup></td> <td>Moderate</td> <td>Moderate</td> <td>Not Assessed</td> <td>Not Assessed</td> </tr> <tr> <td>Coastal</td> <td>None present</td> <td>None present</td> <td>None present</td> <td>None present</td> </tr> </tbody> </table>				Sector	Ecological quality		Chemical quality		Current	Predicted 2015	Current	Predicted 2015	Rivers: Oldbury Naite Rhine (cHMWB) <sup>1</sup>	Not Assessed	Not Assessed	Not Assessed	Not Assessed		Quantitative quality		Chemical quality			Current	Predicted 2015	Current	Predicted 2015	Groundwater: Avonmouth Mercia Mudstone	Good	Good	Good	Good		Ecological quality		Chemical quality		Lakes	None present	None present	None present	None present	Estuarine (cHMWB) <sup>8</sup>	Moderate	Moderate	Not Assessed	Not Assessed	Coastal	None present	None present	None present	None present	
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<sup>8</sup> Candidate Heavily Modified Water Body

Indicator	Data Source	Current Data	Comparators	Trend
		<p>The Oldbury Naite Rhine is the nearest watercourse to the site. The ecological quality and chemical quality of this watercourse have not yet been assessed.</p> <p>There are no coastal waters or lakes in the vicinity of the site. The current ecological quality of the estuarine waters adjacent to the site is moderate and is predicted to maintain at moderate status to 2015. The chemical quality of the estuarine waters has not yet been assessed.</p> <p>There are no groundwater source protection zones in the vicinity of the site. There are some groundwater source protection zones at Wotton-under-Edge in the upper part of the local CAMS area, within the Michael Wood Water Resource Management Unit (WRMU2).</p> <p>The site is located on the Avonmouth Mercia Mudstone aquifer. The current quantitative quality of the groundwater is good and is predicted to maintain good status to 2015. The current chemical quality of the groundwater is good and is predicted to maintain good status to 2015.</p> <p>There are no Designated Shellfish Waters in the vicinity of the site.</p> <p>There are no bathing waters in the area around the site.</p>		
<p><b>Current State of the Waters in the Little Avon Catchment Abstraction Management area</b></p>	<p>4,5</p>	<p>The site at Oldbury is located within the Little Avon Catchment Abstraction Management Strategy area. The CAMS report for this catchment was prepared in March 2008. The CAMS area is rural with little demand for water resources. The site is not located in either of the 2 Water Resource Management Units (WRMUs) within the catchment. Water supply would have to come from one of the two Little Avon WRMUs (Berkeley and Michael Wood) or from neighbouring CAMS areas.</p> <p>Both WRMUs within the Little Avon CAMS area are currently designated “no water available”. This means that there is no water available for further licensing at low flows. Water may be available at high flows with appropriate restrictions. The EA aim to maintain both areas at “no water available” status through to 2017.</p>		

Indicator	Data Source	Current Data	Comparators	Trend
		<p>The Severn Estuary is designated as a Special Area of Conservation (SAC), a Special Protection Area (SPA) and a Site of Special Scientific Interest (SSSI). The area is also designated as a RAMSAR site. This water body is the key local feature that affects water availability within the Berkeley WMU. For the Michael Wood there are 8 No. water related SSSIs that affect water availability within this MWU.</p>		
<p><b>Water Demand and Availability Projected to 2024</b></p>	<p>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'. The site at Oldbury is within the area served by Bristol Water plc. Bristol Water is a water only company, sewerage is dealt with by Wessex Water.</p> <p>Bristol Water operates its jurisdiction as a single resource zone, with all sources used conjunctively. Water in the Bristol Water area comes from a number of different sources. 50% of the water is taken from the River Severn and conveyed to treatment plants via the Gloucester and Sharpness Canal. 15% of the available water comes from groundwater sources. Groundwater and river water sources are supplemented by surface water reservoirs that collect water from the Mendip Hills.</p> <p>There has been a reduction in demand for water in the Bristol Water region over the past 10 years. The daily demand has decreased from 305 MI/d to 285 MI/d. This decrease has been due to the decline in demand from the manufacturing sector and a reduction in mains leakage. However, this conceals a significant increase in household consumption.</p> <p>If growth in population and housing with the region takes place at the forecast rate there would be a planning deficit in water supply by 2012. Bristol Water plc aims to deal with this deficit through the redevelopment of 3 sources and the refurbishment of 5 other sources in the Mendips by 2017. These steps will accompanied by other measures such as leakage improvements, additional pressure reduction zones to cut water losses from leaks and bursts, and increased metering. By 2025 a major new water resource will be developed, which may involve the 2<sup>nd</sup> phase of development of Cheddar Reservoir.</p>		

Indicator	Data Source	Current Data	Comparators	Trend
<p><b>Coastal Processes and Sediments</b></p>		<p>The Severn Estuary has the second highest tidal range in the world. Locally, the tidal range increases eastwards as far as Hinkley Point, where the highest recorded ranges have been up to 15m. Adverse weather conditions can raise water levels by more than 2m above predicted levels and the low-lying coasts on the southern side of the Bristol Channel are particularly vulnerable due to the very high tidal range.</p> <p>The tidal currents in the Bristol Channel generally exceed 1.5m/s at spring tides for long periods and over wide areas. At times, a tidal bore forms in the Severn Estuary which can be up to 2m high. The shoreline is subject to strong winds, powerful waves and substantial storm surges. The general geomorphological context is one of on-going marine transgression with the inner Bristol Channel undergoing enlargement. The rate of marine transgression is very uncertain, however, but an advance (of the estuary) north eastwards along the Severn Vale of up to the order of 20km over the last few millennia may give some indication of change. This process can only accelerate as sea level rises into the future, putting increased pressure on the existing embankments and other defences.</p> <p>The turbulent kinetic energy generated by the high tidal currents in the Bristol Channel maintains high levels of particulate material in suspension. However, the asymmetrical tidal current also means that there is a general westward transport of suspended material with a bed load parting region between Barry and Bridgwater, which lie on opposite sides of the Bristol Channel. It should be noted that each of the possible Severn Tidal Power options will sever the sedimentary dynamic of the Estuary and thus lead to an increase in sedimentation and sedimentary load within the water of the Estuary. The design of the site may have to cope with a significant increase in the sedimentary load of the Estuary's waters and even persistent dredging.</p>		

### Key to Data Sources

1	Environment Agency (Dec 2008) Water for Life and Livelihoods: A consultation on the Draft River Basin Management Plan: Severn River Basin District [online] available: <a href="http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/severn/Intro.aspx">http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/severn/Intro.aspx</a>
2	Environment Agency website <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController">http://maps.environment-agency.gov.uk/wiyby/wiybyController</a>
3	Urban Waste Water Treatment Directive Sensitive Areas; South West Region <a href="http://webarchive.nationalarchives.gov.uk/20080305115859/http://www.defra.gov.uk/environment/water/quality/uwwtd/sensarea/pdf/sensarea-swest.pdf">http://webarchive.nationalarchives.gov.uk/20080305115859/http://www.defra.gov.uk/environment/water/quality/uwwtd/sensarea/pdf/sensarea-swest.pdf</a>
4	Environment Agency (March 2008), The Little Avon Catchment Abstraction Management Strategy
5	Environment Agency, Managing Water Abstraction
6	Bristol Water plc (April 2008), Draft Water Resource Plan
7	<a href="http://www.severnestuary.net/secg/docs/nontechnical_summary.pdf">http://www.severnestuary.net/secg/docs/nontechnical_summary.pdf</a> Accessed 12th March 2009

## Flood Risk

Indicator	Data Source	Current Data	Comparators	Trend
<b>Flood Risk</b>	1,2	<p>Part of this site is in Flood Zone 1, but is almost completely surrounded by Flood Zone 3, 'High Probability', as indicated on the Environment Agency's Floodmap. This means that the site is at risk from coastal flooding with an annual probability of flooding of &gt;0.5% in any one year.</p> <p>The site is shown to be defended. However no detail was available at this stage on the composition, condition grade and standard of protection afforded by these defences.</p> <p>Map available separately</p> <p>The SMP1 indicates that the defences are mostly set back from the foreshore and the policy response for management for these defences is to 'hold the line', i.e. continue to maintain and possibly improve the current level of defence.</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"> <li>• Global sea level rise has accelerated between mid 19th century and mid 20th century and is now about 3mm per year</li> <li>• 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</li> <li>• 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</li> </ul>

Indicator	Data Source	Current Data	Comparators	Trend
				<p>Most recently in June 2009, UKCIP launched the latest UK Climate Change Predictions 2009 (UKCP09). These give information about climate 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"> <li>• All areas of the UK get warmer, and the warming is greater in summer than in winter.</li> <li>• 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.</li> <li>• Sea levels rise and the rise is greater in the south of the UK than in the north.</li> </ul>

**Key to Data Sources**

1	Environment Agency website <a href="http://maps.environment-agency.gov.uk/wiyby/wiybyController">http://maps.environment-agency.gov.uk/wiyby/wiybyController</a>
2	<a href="http://www.severnestuary.net/secg/docs/nontechnical_summary.pdf">http://www.severnestuary.net/secg/docs/nontechnical_summary.pdf</a> Accessed 12th March 2009

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