

# Appendices to the Habitats Regulations Assessment Site Report for Bradwell

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



## **Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement**

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

**The Habitats Regulations Assessment is provided in the following documents:**

### **HRA Non-Technical Summary**

#### **Main HRA Report of the revised draft Nuclear NPS**

- Introduction
- Methods
- Findings

#### **Annexes to the Main HRA Report: Reports on Sites**

- Site HRA Reports
- Technical Appendices

All documents are available on the website of the Department of Energy and Climate Change at [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

This document is the Appendices to the HRA site report for Bradwell.

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

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## Appendix 1: European Site Characterisations

Natura 2000 Site Identification				
Natura 2000 Designation	Radius (measured from central grid reference point, MAGIC)			
	5km	10km	15km	20km
SAC	<ul style="list-style-type: none"> <li>Essex Estuaries</li> </ul>			
SPA	<ul style="list-style-type: none"> <li>Dengie (Mid-Essex Coast Phase 1)</li> <li>Blackwater Estuary (Mid Essex Coast Phase 4)</li> <li>Outer Thames Estuary SPA</li> </ul>	<ul style="list-style-type: none"> <li>Colne Estuary (Mid-Essex Coast Phase 2)</li> <li>Abberton Reservoir</li> </ul>	<ul style="list-style-type: none"> <li>Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)</li> <li>Foulness (Mid-Essex Coast Phase 5)</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>
Ramsar	<ul style="list-style-type: none"> <li>Dengie (Mid-Essex Coast Phase 1)</li> <li>Blackwater Estuary (Mid-Essex Coast Phase 4)</li> </ul>	<ul style="list-style-type: none"> <li>Colne Estuary (Mid-Essex Coast Phase 2)</li> <li>Abberton Reservoir</li> </ul>	<ul style="list-style-type: none"> <li>Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)</li> <li>Foulness (Mid-Essex Coast Phase 5)</li> </ul>	<ul style="list-style-type: none"> <li>None</li> </ul>

All core site-specific information, unless otherwise stated, has been referenced from Natural England Sources ([Natura 2000 Management Plans](#)) (Nature on the Map) and the Joint Nature Conservation Committee website ([Protected Sites](#)).

## Natura 2000 Site Characterisations

### Special Areas of Conservation (SAC)<sup>1</sup>

1. Essex Estuaries

### Special Protection Areas (SPA)<sup>2</sup>

1. Dengie (Mid-Essex Coast Phase 1)
2. Colne Estuary (Mid-Essex Coast Phase 2)
3. Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)
4. Blackwater Estuary (Mid-Essex Coast Phase 4)
5. Foulness (Mid-Essex Coast Phase 5)
6. Abberton Reservoir
7. Outer Thames Estuary SPA<sup>3</sup>

Together the Essex Estuaries SAC and the Mid-Essex Coast SPA's form the Essex Estuaries European Marine Site (EMS)<sup>4</sup>

### Ramsar Sites<sup>5</sup>

1. Dengie (Mid-Essex Coast Phase 1)

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<sup>1</sup> **Special Areas of Conservation (SACs)** are classified under the Habitats Directive and provide rare and vulnerable animals, plants and habitats with increased protection and management.

<sup>2</sup> **Special Protection Areas (SPAs)** are classified under the Birds Directive to help protect and manage areas which are important for rare and vulnerable birds because they use them for breeding, feeding, wintering or migration. Together SACs and SPAs make up the Natura 2000 series.

<sup>3</sup> In November 2009 Natural England, Countryside Council for Wales and the Joint Nature Conservation Committee launched a consultation on 10 new possible SACs and two new potential SPAs in English, Welsh and offshore waters around the UK, including Outer Thames Estuary pSPA (see <http://www.naturalengland.org.uk/ourwork/marine/sacconsultation/default.aspx>). The consultation closed in February 2010. A decision on whether to submit the SACs to the European Commission and whether to classify the SPAs is expected in August 2010. UK Government policy states that potential SPAs are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them.

<sup>4</sup> The term '**European marine sites**' is the collective term for Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) that are covered by tidal water and protect some of our most special marine and coastal habitats and species of European importance.

<sup>5</sup> **Ramsar sites** are designated under the Convention on Wetlands of International Importance. The broad objectives are to stem the loss and progressive encroachment on wetlands now and in the future. These are often coincident with SPA sites designated under the Birds Directive. Although RAMSAR sites are not considered part of the Natura 2000 network, they are treated the same way as Natura 2000 sites.

2. Colne Estuary (Mid-Essex Coast Phase 2)
3. Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)
4. Blackwater Estuary (Mid-Essex Coast Phase 4)
5. Foulness (Mid-Essex Coast Phase 5)
6. Abberton Reservoir

All core site specific information unless otherwise stated has been referenced from Natural England Sources ([Natura 2000 Management Plans](#)) (Nature on the Map) and the Joint Nature Conservation Committee website ([Protected Sites](#)). Information on the new draft designation of the Outer Thames Estuary SPA has been obtained from Natural England’s [consultation website](#).

## Special Areas of Conservation

### Site Name: Essex Estuaries

- Location 010237E/514206N
- JNCC Site Code **UK0013690**
- Size: 46140.82 (ha)
- Designation: SAC

Essex Estuaries SAC	
Site Description	This is a large estuarine site in South East England, and is a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site comprises the major estuaries of the Colne, Blackwater, Crouch and Roach rivers and is important as an extensive area of contiguous estuarine habitat. Essex Estuaries contains a very wide range of characteristic marine and estuarine sediment communities and some diverse and unusual marine communities in the lower reaches, including rich sponge communities on mixed, tide swept substrates. Sublittoral areas have a very rich invertebrate fauna, including the reef-building worm <i>Sabellaria spinulosa</i> , the brittlestar <i>Ophiothrix fragilis</i> , crustaceans and ascidians. The site also has large areas of saltmarsh and other important coastal habitats.

Essex Estuaries SAC	
Qualifying Features	<p>Annex I habitats that are a primary reason for selection of this site</p> <p><u>1130 Estuaries</u></p> <p><u>1140 Mudflats and sandflats not covered by seawater at low tide</u></p> <p><u>1310 <i>Salicornia</i> and other annuals colonizing mud and sand</u></p> <p><u>1320 <i>Spartina</i> swards (<i>Spartinion maritimae</i>)</u></p> <p><u>1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</u></p> <p><u>1420 Mediterranean and thermo-atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)</u></p> <p>Annex I habitats that present as a qualifying feature, but not a primary reason for selection of this site</p> <p><u>1110 Sandbanks which are slightly covered by sea water all the time</u></p>
Conservation Objectives <sup>6</sup>	<p>Conservation objectives for Essex Estuaries SAC are as follows:</p> <p>1130 Estuaries Subject to natural change, maintain the estuaries in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh communities</li> <li>• Intertidal mudflat and sandflat communities</li> <li>• Rock communities</li> <li>• Subtidal mud communities</li> <li>• Subtidal muddy sand communities</li> <li>• Subtidal mixed sediment communities</li> </ul> <p>1140 Mudflats and sandflats not covered by seawater at low tide Subject to natural change, maintain the mudflats and sand flats not covered by seawater at low tide in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Mud communities</li> </ul>

<sup>6</sup> Essex Estuaries European Marine Site, English Nature's Advice given under Regulation 33(2) of the Conservation (Natural Habitats &c.) Regulations 1994. June 2000.

	Essex Estuaries SAC
	<ul style="list-style-type: none"> <li>• Muddy sand communities</li> <li>• Sand and gravel communities</li> </ul> <p>1310 <i>Salicornia</i> and other annuals colonizing mud and sand                      Subject to natural change, maintain <i>Salicornia</i> and other annuals colonising mud and sand in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Glasswort/annual sea-blite community</li> <li>• Sea aster community</li> </ul> <p>1320 <i>Spartina</i> swards                      Subject to natural change, maintain the <i>Spartina</i> swards (<i>Spartinion</i>) in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Small cordgrass community</li> <li>• Smooth cordgrass community</li> </ul> <p>1330 Atlantic salt meadows                      Subject to natural change, maintain the Atlantic salt meadows (<i>Glauco-Puccinellietalia</i>) in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Lowland/mid-marsh communities</li> <li>• Upper marsh communities</li> <li>• Upper marsh transitional communities</li> <li>• Drift-line community</li> </ul> <p>1420 Mediterranean and thermo-atlantic halophilous scrubs (<i>Arthrocnemetalia fruticosae</i>)                      Subject to natural change, maintain the Mediterranean and thermo-atlantic halophilous scrubs (<i>Arthrocnemetalia fruticosae</i>) in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Shrubby sea-blite community</li> <li>• Rock sea lavender/sea heath community</li> </ul>

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Component SSSIs	Component SSSI (17 units) condition status: <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">SAC component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Colne Estuary SSSI (45 units)</td> <td>47.16%</td> <td>0.00%</td> <td>0.00%</td> <td>52.84%</td> <td>0.00%</td> </tr> <tr> <td style="background-color: #d3d3d3;">Blackwater Estuary SSSI (89 units)</td> <td>28.46%</td> <td>10.80%</td> <td>1.72%</td> <td>59.02%</td> <td>0.00%</td> </tr> <tr> <td style="background-color: #d3d3d3;">Foulness SSSI (33 units)</td> <td>77.94%</td> <td>0.30%</td> <td>0.80%</td> <td>20.96%</td> <td>0.00%</td> </tr> <tr> <td style="background-color: #d3d3d3;">Crouch and Roach Estuaries SSSI (58 units)</td> <td>23.50%</td> <td>0.00%</td> <td>0.67%</td> <td>75.83%</td> <td>0.00%</td> </tr> <tr> <td style="background-color: #d3d3d3;">Dengie SSSI (9 units)</td> <td>62.77%</td> <td>0.00%</td> <td>0.00%</td> <td>37.23%</td> <td>0.00%</td> </tr> </tbody> </table>	SAC component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Colne Estuary SSSI (45 units)	47.16%	0.00%	0.00%	52.84%	0.00%	Blackwater Estuary SSSI (89 units)	28.46%	10.80%	1.72%	59.02%	0.00%	Foulness SSSI (33 units)	77.94%	0.30%	0.80%	20.96%	0.00%	Crouch and Roach Estuaries SSSI (58 units)	23.50%	0.00%	0.67%	75.83%	0.00%	Dengie SSSI (9 units)	62.77%	0.00%	0.00%	37.23%	0.00%
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Key Environmental Conditions (factors that maintain site integrity)	<b>Key environmental conditions:</b> <ul style="list-style-type: none"> <li>• Good water quality and sediment quality should be maintained, and the sediment budget within the estuarine or coastal system should not be restricted by anthropogenic influences.</li> <li>• The location and extent of mud or sandflats is dependent on the extent to which the estuary or coast where they occur is constrained from responding to sea level rise and changing sediment regimes. Management needs to create space to enable landward roll-back to take place in</li> </ul>																																				

Essex Estuaries SAC	
	<p>response to sea-level rise, and should also allow the system to be dynamic and retain the flexibility to respond to associated changes such as the movement of physical features within the system, e.g. migrating sub tidal communities.</p> <ul style="list-style-type: none"> <li>• There are a number of factors that are contributing to saltmarsh change that management may need to take into consideration These include coastal erosion as a result of coastal flood defence works, rising sea levels, variations in sediment deposition, and land claim for development. Site integrity will be dependent on maintaining the range of community types from low to high marsh by allowing natural roll back of the saltmarsh to occur.</li> <li>• Ensure that all exploitation of biological resources is environmentally sustainable and maintains or enhances habitats and their characteristic species.</li> </ul> <p><b>To maintain site integrity;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats (Estuaries, Saltmarsh and Intertidal mudflats and sandflats)</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> </ul>
<b>SAC Condition Assessment</b>	See SSSI condition status for specific information on condition.
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>The saltmarshes and mudflats are under threat from ‘coastal squeeze’ – man made sea defences prevent landward migration of these habitats in response to sea-level rise. These habitats are also vulnerable to plans or projects (onshore and offshore) which have impacts on sediment transport.</p> <p>Other generic vulnerabilities are summarised below:</p> <p><b>Physical loss</b></p> <ul style="list-style-type: none"> <li>• Removal e.g. harvesting, coastal development</li> </ul>

	Essex Estuaries SAC
	<ul style="list-style-type: none"> <li>• Smothering e.g. by artificial structures, disposal of dredge spoil</li> </ul> <p><b>Physical damage</b></p> <ul style="list-style-type: none"> <li>• Siltation e.g. run-off, channel dredging, outfalls</li> <li>• Abrasion e.g. boating, anchoring, trampling</li> <li>• Selective extraction e.g. aggregate dredging, entanglement</li> </ul> <p><b>Toxic contamination</b></p> <ul style="list-style-type: none"> <li>• Introduction of synthetic compounds e.g. pesticides, TBT, PCBs</li> <li>• Introduction of non-synthetic compounds e.g. heavy metals, hydrocarbons</li> <li>• Introduction of radionuclides</li> </ul> <p><b>Non-toxic contamination</b></p> <ul style="list-style-type: none"> <li>• Nutrient enrichment e.g. agricultural run-off, outfalls</li> <li>• Organic enrichment e.g. mariculture, outfalls</li> <li>• Changes in thermal regime e.g. power stations</li> <li>• Changes in turbidity e.g. run-off, dredging</li> <li>• Changes in salinity e.g. water abstraction, outfalls</li> </ul> <p><b>Biological disturbance</b></p> <ul style="list-style-type: none"> <li>• Introduction of microbial pathogens</li> <li>• Introduction of non-native species and translocation</li> <li>• Selective extraction of species e.g. bait digging, wildfowling, commercial and recreational fishing</li> </ul>
<b>Landowner/ Management Responsibility</b>	<p>An Essex Estuaries Initiative (<a href="http://www.essexestuaries.org.uk">www.essexestuaries.org.uk</a>) was set up in 1998 to provide an umbrella framework for a variety of coastal initiatives in the locale of the Essex Estuaries European Marine Site (within which the Essex Estuaries SAC is included). It is a proactive network to facilitate co-ordination and co-operation between organisations responsible for coastal management. Many organisations are involved, in</p>

Essex Estuaries SAC	
	<p>the Essex Estuaries there are 14 statutory authorities directly responsible for the management of the coast.</p> <p>A Coastal Habitat Management Plan (Champ) has also been produced for the Essex Estuaries.  <a href="http://www.eclife.naturalengland.org.uk/champs/pilots.asp">http://www.eclife.naturalengland.org.uk/champs/pilots.asp</a></p>
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>East of England Regional Spatial Strategy: Habitats Directive Assessment.</b> Government Office for the East of England. ERM 2006</p> <ul style="list-style-type: none"> <li>• Report gives mention to possible effects on the SAC through housing growth impacts e.g. effluent discharge impacts. Also mentions that Natura 2000 sites to be considered in more detail at LDD level.</li> </ul> <p><b>Appropriate Assessment of the Draft South East Plan</b> , South East England Regional Assembly, (October 2006, Scott Wilson, Levett – Thriverl)</p> <ul style="list-style-type: none"> <li>• Plan notes that the site is at risk from increased recreational pressure and increased effluent discharge associated with developments.</li> </ul> <p><b>Appropriate Assessment of the Chelmsford Core Strategy and Development Control Policies Submission Document DPD.</b> Chelmsford Borough Council (November 2006, Entec UK Ltd)</p> <ul style="list-style-type: none"> <li>• SAC at risk from increased recreational pressure from high density housing and from new industrial development.</li> </ul> <p><b>Habitat Regulations Assessment of the Thurrock LDF Core Strategy.</b> Thurrock Council (October 2007, Scott Wilson)</p> <ul style="list-style-type: none"> <li>• SAC at risk from harmful levels of abstraction due to increased water needs within Thurrock.</li> <li>• SAC at risk from disturbance and damage to habitats through increased recreational pressure.</li> </ul> <p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Numerous options for extraction sites presented, some of which may impact on the SAC.</li> </ul>

	Essex Estuaries SAC
	<ul style="list-style-type: none"> <li>• New aggregate recycling facilities may also impact on the SAC.</li> </ul> <p><b>Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme. North East Elsenham.</b> Department for Communities and Local Government (November 2008, Scott Wilson Ltd).</p> <ul style="list-style-type: none"> <li>• Increased water demand as a result of the Elsenham Eco-town may result in increased levels of abstraction that may lead to an adverse impact on the Essex Estuaries SAC in combination with other plans/projects.</li> </ul> <p><b>Maldon District Core Strategy issues and Options. Information for Appropriate Assessment Screening DRAFT 1.</b> Maldon District Council (2007, ARUP)</p> <ul style="list-style-type: none"> <li>• Screening identifies numerous policies which could lead to impacts mainly relating to urban regeneration, renewable energy and recreational facilities.</li> </ul>

## Special Protection Areas

Site Name: Dengie (Mid-Essex Coast Phase 1)

- Location 005734E/514126N
- JNCC Site Code: [UK9009242](#)
- Size: 3127.23ha
- Designation: SPA

Dengie (Mid-Essex Coast Phase 1) SPA	
<b>Site Description</b>	Dengie is located on the coast of Essex in eastern England. It is a large and remote area of tidal mud-flats and saltmarshes at the eastern end of the Dengie peninsula, between the adjacent Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. Foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. It is of importance for wintering populations of Hen Harrier <i>Circus cyaneus</i> , wildfowl and waders. Dengie is an integral component of the phased Mid-Essex Coast SPA.
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <ul style="list-style-type: none"> <li>• <a href="#">Bar-tailed Godwit</a> <i>Limosa lapponica</i></li> <li>• <a href="#">Hen Harrier</a> <i>Circus cyaneus</i></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <ul style="list-style-type: none"> <li>• <a href="#">Grey Plover</a> <i>Pluvialis squatarola</i></li> <li>• <a href="#">Knot</a> <i>Calidris canutus</i></li> <li>• <a href="#">Dark Bellied Brent Goose</a> <i>Branta bernicla bernicla</i></li> </ul> <p>The Dengie SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders)</p> <ul style="list-style-type: none"> <li>• Over winter the area regularly supports 31,452 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>

Dengie (Mid-Essex Coast Phase 1) SPA													
<b>Conservation Objectives</b>	<p><b>Conservation objectives for Dengie SPA interest features are as follows:</b></p> <p>Subject to natural change, maintain habitats for the internationally important populations of regularly occurring migratory bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and Cobble Shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain habitats for the internationally important assemblage of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and Cobble Shores</li> <li>• Grassland/grazing marsh</li> </ul>												
<b>Component SSSIs</b>	<p>SSSIs including condition status:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="text-align: left;">SPA Component SSSI's</th> <th>Favourable</th> <th>Unfavourable recovering</th> <th>Unfavourable no change</th> <th>Unfavourable declining</th> <th>Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="text-align: left;">Dengie SSSI (9 units)</td> <td>62.77%</td> <td>0.00%</td> <td>0.00%</td> <td>37.23%</td> <td>0.00%</td> </tr> </tbody> </table>	SPA Component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Dengie SSSI (9 units)	62.77%	0.00%	0.00%	37.23%	0.00%
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<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key species requirements:</b></p> <ul style="list-style-type: none"> <li>• Bar-Tailed Godwits are dependent on coastal habitats in winter feeding mainly on worms both on sandy and muddy shores.</li> <li>• Hen Harriers move to the lowlands over winter, particularly the coast and are known to hunt especially over saltmarsh, marshes and lowland farmland.</li> </ul>												

	Dengie (Mid-Essex Coast Phase 1) SPA
	<ul style="list-style-type: none"> <li>• Grey Plover are dependent on muddy estuaries and other soft sediment coastlines in winter.</li> <li>• Wintering Knot are almost exclusively dependent on estuarine habitats and are specialist feeders on bivalves molluscs e.g. cockles.</li> <li>• Dark Bellied Brent Geese wintering habitat is mostly shallow coasts and estuaries with extensive mudflats and intertidal areas. They feed on eelgrass beds and algae on a variety of estuarine habitats as well as damp pasture.</li> </ul> <p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting.</li> </ul> <p><b>To maintain site integrity of estuarine habitats important for birds;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities.</li> </ul> <p><b>To maintain site integrity of terrestrial habitat important for birds (primarily grazing marsh);</b></p> <ul style="list-style-type: none"> <li>• Maintain and enhance water level supply, water quality and water level management in grazing marshes</li> <li>• Minimise/compensate or mitigate habitat loss due to sea defence improvement schemes</li> </ul>

	<b>Dengie (Mid-Essex Coast Phase 1) SPA</b>
	<ul style="list-style-type: none"> <li>• Employ appropriate grazing and mowing regimes</li> <li>• Minimise risk of disturbance/damage to wildlife and habitats from recreation.</li> </ul>
<b>SPA Condition Assessment</b>	See SSSI condition assessment.
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Site-specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• The main threat to the site is erosion of intertidal habitats due to a combination of sea level rise and isostatic forces operating on the land mass of Great Britain. The situation is worsened with increasing winter storm events whilst the hard sea walls along this coastline are preventing the saltmarsh and intertidal areas from migrating inland. The situation is being addressed by alternative food defence techniques. The shoreline management plan for the Essex Coast which seeks to provide a blueprint for managing the coast sustainably is currently being revised.</li> <li>• The Thames Fishery is coming under increased pressure from boats that previously fished the Wash for cockles. Controls over the fishery have been put in place by Kent and Essex Sea Fisheries Committee.</li> <li>• In addition important bird assemblages that use the mud and sandflats for feeding and roosting are vulnerable to disturbance from human activities.</li> </ul> <p><b>Species-specific vulnerabilities<sup>7</sup></b></p> <ul style="list-style-type: none"> <li>• Internationally, Bar-Tailed Godwits are threatened by the degradation of foraging sites due to land reclamation, pollution, and human disturbance</li> </ul> <p><b>Generic vulnerabilities relating to the habitats which support important birds</b></p> <p><b>Estuarine habitats</b></p> <p><u>Physical loss</u></p> <ul style="list-style-type: none"> <li>• Removal e.g. harvesting, coastal development</li> </ul>

<sup>7</sup> Information on birds obtained from Birdlife International, The British Trust for Ornithology and The RSPB websites.

	Dengie (Mid-Essex Coast Phase 1) SPA
	<ul style="list-style-type: none"> <li>• Smothering e.g. by artificial structures, disposal of dredge spoil</li> </ul> <p><u>Physical damage</u></p> <ul style="list-style-type: none"> <li>• Siltation e.g. run-off, channel dredging, outfalls</li> <li>• Abrasion e.g. boating, anchoring, trampling</li> <li>• Selective extraction e.g. aggregate dredging, entanglement</li> </ul> <p><u>Non-physical disturbance</u></p> <ul style="list-style-type: none"> <li>• Noise e.g. boating, anchoring, trampling</li> <li>• Visual e.g. recreational activity</li> </ul> <p><u>Toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Introduction of synthetic compounds e.g. pesticides, TBT, PCBs</li> <li>• Introduction of non-synthetic compounds e.g. heavy metals, hydrocarbons</li> <li>• Introduction of radionuclides</li> </ul> <p><u>Non-toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Nutrient enrichment e.g. agricultural run-off, outfalls</li> <li>• Organic enrichment e.g. mariculture, outfalls</li> <li>• Changes in thermal regime e.g. power stations</li> <li>• Changes in turbidity e.g. run-off, dredging</li> <li>• Changes in salinity e.g. water abstraction, outfalls</li> </ul> <p><u>Biological disturbance</u></p> <ul style="list-style-type: none"> <li>• Introduction of microbial pathogens</li> <li>• Introduction of non-native species and translocation</li> <li>• Selective extraction of species e.g. bait digging, wildfowling, commercial and recreational fishing</li> </ul>

Dengie (Mid-Essex Coast Phase 1) SPA	
	<p><b>Grazing Marsh</b></p> <ul style="list-style-type: none"> <li>• Habitat loss through built development</li> <li>• Habitat loss through sea level rise</li> <li>• Inadequate water supply</li> <li>• Impact of agriculture and sewage on water supply</li> <li>• Grassland habitat loss/damage through sea wall improvement</li> <li>• Disposal of channel dredging</li> <li>• Use of herbicides/pesticides</li> </ul>
<b>Landowner/ Management Responsibility</b>	<p>An Essex Estuaries Initiative (<a href="http://www.essexestuaries.org.uk">www.essexestuaries.org.uk</a>) was set up in 1998 to provide an umbrella framework for a variety of coastal initiatives in the locale of the Essex Estuaries European Marine Site (within which Dengie SPA is included). It is a proactive network to facilitate co-ordination and co-operation between organisations responsible for coastal management. Many organisations are involved, in the Essex Estuaries there are 14 statutory authorities directly responsible for the management of the coast.</p> <p>A Coastal Habitat Management Plan (Champ) has also been produced for the Essex Estuaries and covers the Dengie SPA. <a href="http://www.eclife.naturalengland.org.uk/champs/pilots.asp">http://www.eclife.naturalengland.org.uk/champs/pilots.asp</a></p> <p>Management plans have been produced for the Crouch and Roach Estuaries and Blackwater Estuary. The northern part of the Dengie SPA falls under the management plan for Blackwater Estuary whilst the remainder falls under the management plan for Crouch and Roach Estuary.</p> <p>The Dengie site is also designated as a National Nature Reserve. Natural England is usually responsible for management of NNRs.</p>
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>East of England Regional Spatial Strategy: Habitats Directive Assessment.</b> Government Office for the East of England. ERM 2006</p>

	Dengie (Mid-Essex Coast Phase 1) SPA
	<ul style="list-style-type: none"> <li>• Report gives mention to possible effects through housing growth impacts e.g. effluent discharge impacts. Also mentions that Natura 2000 sites to be considered in more detail at LDD level.</li> </ul> <p><b>Appropriate Assessment of the Draft South East Plan</b> , South East England Regional Assembly, (October 2006, Scott Wilson, Levett – Thrivel)</p> <ul style="list-style-type: none"> <li>• Plan notes that the site is at risk from increased recreational pressure and increased effluent discharge associated with developments.</li> </ul> <p><b>Appropriate Assessment of the Chelmsford Core Strategy and Development Control Policies Submission Document DPD.</b> Chelmsford Borough Council (November 2006, Entec UK Ltd)</p> <ul style="list-style-type: none"> <li>• SPA at risk from increased recreational pressure from high density housing and from new industrial development.</li> </ul> <p><b>Habitat Regulations Assessment of the Thurrock LDF Core Strategy.</b> Thurrock Council (October 2007, Scott Wilson)</p> <ul style="list-style-type: none"> <li>• SPA at risk from harmful levels of abstraction due to increased water needs within Thurrock.</li> <li>• SPA at risk from disturbance and damage to habitats through increased recreational pressure.</li> </ul> <p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Numerous options for extraction sites presented, some of which may impact on the SPA.</li> <li>• New aggregate recycling facilities may also impact on the SPA.</li> </ul> <p><b>Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme. North East Elsenham.</b> Department for Communities and Local Government (November 2008, Scott Wilson Ltd).</p> <ul style="list-style-type: none"> <li>• Increased water demand as a result of the Elsenham Eco-town may result in increased levels of abstraction that may lead to an adverse impact on the SPA in combination with other</li> </ul>

	Dengie (Mid-Essex Coast Phase 1) SPA
	<p>plans/projects.</p> <p><b>Maldon District Core Strategy issues and Options. Information for Appropriate Assessment Screening</b> DRAFT 1. Maldon District Council (2007, ARUP)</p> <ul style="list-style-type: none"><li>• Screening identifies numerous policies which could lead to impacts mainly relating to urban regeneration, renewable energy and recreational facilities.</li></ul>

**Site Name: Colne Estuary**

- Location Grid Ref: 005736E/514857N
- JNCC Site Code: [UK9009243](#)
- Size: 2701.43ha
- Designation: SPA

Colne Estuary SPA	
<b>Site Description</b>	<p>The Colne Estuary is located on the coast of Essex in eastern England. It is a comparatively short and branching estuary, with five tidal arms that flow into the main channel of the River Colne. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mud-flat communities typical of south-eastern English estuaries. The estuary is of importance for a range of wintering wildfowl and waders, in addition to breeding Little Tern <i>Sterna albifrons</i> which nest on shell, sand and shingle spits. There is a wide variety of coastal habitats which include mud-flat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds which provide feeding and roosting opportunities for the large numbers of waterbirds that use the site.</p> <p>The Colne Estuary is an integral component of the phased Mid-Essex Coast SPA.</p>
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>During the breeding season the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Little Tern</a> <i>Sterna albifrons</i></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a> <i>Recurvirostra avocetta</i></li> <li>• <a href="#">Golden Plover</a> <i>Pluvialis apricaria</i></li> <li>• <a href="#">Hen Harrier</a> <i>Circus cynaeus</i></li> </ul>

	<b>Colne Estuary SPA</b>
	<p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species: Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Dark-Bellied Brent Goose</a> <i>Branta bernicla bernicla</i></li> <li>• <a href="#">Redshank</a> <i>Tringa totanus</i></li> </ul> <p>The Colne Estuary SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 38,548 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<p><b>Conservation objectives for Colne Estuary SPA interest features are as follows:</b></p> <p>Subject to natural change, maintain the habitats for the internationally important populations of the regularly occurring Annex 1 bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Sand and gravel shores</li> <li>• Shallow Coastal Waters</li> <li>• Grassland/Grazing Marsh</li> <li>• Intertidal mudflats and sandflats</li> </ul> <p>Subject to natural change, maintain the habitats for the internationally important populations of regularly occurring migratory bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Grassland/grazing marsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> </ul>

Colne Estuary SPA													
	<p>Subject to natural change, maintain the habitats for the internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Shallow coastal waters</li> <li>• Grassland/grazing marsh</li> </ul>												
<b>Component SSSIs</b>	<p>SSSI component condition status:</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">SPA component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Colne Estuary SSSI (45 units)</td> <td>47.16%</td> <td>0.00%</td> <td>0.00%</td> <td>52.84%</td> <td>0.00%</td> </tr> </tbody> </table>	SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Colne Estuary SSSI (45 units)	47.16%	0.00%	0.00%	52.84%	0.00%
SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Colne Estuary SSSI (45 units)	47.16%	0.00%	0.00%	52.84%	0.00%								
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key species requirements:</b></p> <ul style="list-style-type: none"> <li>• Little Tern breeding populations nest on the coast utilising sand and shingle beaches and spits as well as tiny islets of sand/rock close inshore.</li> <li>• The preferred habitat of Avocets during winter is estuarine systems where substrate is largely comprised of fine silt.</li> <li>• Grassland is the preferred feeding habitat of the Golden Plover with rich permanent pastures</li> </ul>												

	<b>Colne Estuary SPA</b>
	<p>preferred. The inter-tidal zone is also an important feeding habitat.</p> <ul style="list-style-type: none"> <li>• Hen Harriers move to the lowlands over winter, particularly the coast and are known to hunt especially over saltmarsh, marshes and lowland farmland.</li> <li>• Dark Bellied Brent Geese wintering habitat is mostly shallow coasts and estuaries with extensive mudflats and intertidal areas. They feed on eelgrass beds and algae on a variety of estuarine habitats as well as damp pasture.</li> <li>• Redshank populations are predominantly within estuary systems in winter.</li> </ul> <p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting.</li> </ul> <p><b>To maintain site integrity of estuarine habitats important for birds;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities.</li> </ul> <p><b>To maintain site integrity of terrestrial habitat important for birds (primarily grazing marsh);</b></p> <ul style="list-style-type: none"> <li>• Maintain and enhance water level supply, water quality and water level management in grazing marshes</li> </ul>

	<b>Colne Estuary SPA</b>
	<ul style="list-style-type: none"> <li>• Minimise/compensate or mitigate habitat loss due to sea defence improvement schemes</li> <li>• Employ appropriate grazing and mowing regimes</li> <li>• Minimise risk of disturbance/damage to wildlife and habitats from recreation</li> </ul>
<b>SPA Condition Assessment</b>	See component SSSIs
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Site-specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• The Colne Estuary encompasses a diversity of soft coastal habitats, dependent on natural coastal processes. The vulnerability of these habitats is linked to changes in the physical environment, the intertidal zone is threatened by coastal squeeze and changes to sediment budget, especially updrift of the site. Beach feeding has been undertaken to alleviate the sediment problem.</li> <li>• The site is also vulnerable to recreational pressures which can lead to habitat damage (salt marsh and sand dunes) and to disturbance of feeding and roosting waterfowl.</li> <li>• Low water levels are also of concern and low freshwater flows into the estuary may be affecting bird numbers and/or distribution.</li> </ul> <p><b>Species specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• At an international level Little Terns are highly vulnerable to human disturbance which can lead to nest failure. They are also threatened by habitat destruction e.g. development/reclamation of coastal habitat and pesticide pollution.</li> </ul> <p><b>Generic vulnerabilities relating to the habitats which support important birds:</b></p> <p><b>Estuarine habitats</b></p> <p><u>Physical loss</u></p> <ul style="list-style-type: none"> <li>• Removal e.g. harvesting, coastal development</li> <li>• Smothering e.g. by artificial structures, disposal of dredge spoil</li> </ul>

	<b>Colne Estuary SPA</b>
	<p><u>Physical damage</u></p> <ul style="list-style-type: none"> <li>• Siltation e.g. run-off, channel dredging, outfalls</li> <li>• Abrasion e.g. boating, anchoring, trampling</li> <li>• Selective extraction e.g. aggregate dredging, entanglement</li> </ul> <p><u>Non-physical disturbance</u></p> <ul style="list-style-type: none"> <li>• Noise e.g. boating, anchoring, trampling</li> <li>• Visual e.g. recreational activity</li> </ul> <p><u>Toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Introduction of synthetic compounds e.g. pesticides, TBT, PCBs</li> <li>• Introduction of non-synthetic compounds e.g. heavy metals, hydrocarbons</li> <li>• Introduction of radionuclides</li> </ul> <p><u>Non-toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Nutrient enrichment e.g. agricultural run-off, outfalls</li> <li>• Organic enrichment e.g. mariculture, outfalls</li> <li>• Changes in thermal regime e.g. power stations</li> <li>• Changes in turbidity e.g. run-off, dredging</li> <li>• Changes in salinity e.g. water abstraction, outfalls</li> </ul> <p><u>Biological disturbance</u></p> <ul style="list-style-type: none"> <li>• Introduction of microbial pathogens</li> <li>• Introduction of non-native species and translocation</li> <li>• Selective extraction of species e.g. bait digging, wildfowling, commercial and recreational fishing</li> </ul> <p><b>Grazing Marsh</b></p>

	<b>Colne Estuary SPA</b>
	<ul style="list-style-type: none"> <li>• Habitat loss through built development</li> <li>• Habitat loss through sea level rise</li> <li>• Inadequate water supply</li> <li>• Impact of agriculture and sewage on water supply</li> <li>• Grassland habitat loss/damage through sea wall improvement</li> <li>• Disposal of channel dredging</li> <li>• Use of herbicides/pesticides</li> </ul>
<b>Landowner/ Management Responsibility</b>	<p>An Essex Estuaries Initiative (<a href="http://www.essexestuaries.org.uk">www.essexestuaries.org.uk</a>) was set up in 1998 to provide an umbrella framework for a variety of coastal initiatives in the locale of the Essex Estuaries European Marine Site (within which Colne Estuary SPA is included). It is a proactive network to facilitate co-ordination and co-operation between organisations responsible for coastal management. Many organisations are involved, in the Essex Estuaries there are 14 statutory authorities directly responsible for the management of the coast.</p> <p>A Coastal Habitat Management Plan (Champ) has also been produced for the Essex Estuaries and covers the Colne Estuary SPA. <a href="http://www.eclife.naturalengland.org.uk/champs/pilots.asp">http://www.eclife.naturalengland.org.uk/champs/pilots.asp</a></p> <p>The Colne Estuary Partnership is a collaboration between Colchester Borough Council, Tendring District Council and Natural England, established to develop a management strategy for the Colne Estuary area. A strategy has been produced and can be found at The Essex Estuaries website: <a href="http://www.essexestuaries.org.uk/pdf/ColneEstuaryStrategyDOC.pdf">http://www.essexestuaries.org.uk/pdf/ColneEstuaryStrategyDOC.pdf</a></p> <p>The Colne Estuary is also designated as a National Nature Reserve. The site is managed by Natural England and Essex Wildlife Trust.</p>
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>East of England Regional Spatial Strategy: Habitats Directive Assessment.</b> Government Office for the East of England. ERM 2006</p> <ul style="list-style-type: none"> <li>• Report gives mention to possible effects on the SPA through housing growth impacts e.g. effluent</li> </ul>

	<b>Colne Estuary SPA</b>
	<p>discharge impacts. Also mentions that Natura 2000 sites to be considered in more detail at LDD level.</p> <p><b>Appropriate Assessment of the Draft South East Plan</b> , South East England Regional Assembly, (October 2006, Scott Wilson, Levett – Thrivel)</p> <ul style="list-style-type: none"> <li>• Plan notes that the site is at risk from increased recreational pressure and increased effluent discharge associated with developments.</li> </ul> <p><b>Appropriate Assessment of the Chelmsford Core Strategy and Development Control Policies Submission Document DPD.</b> Chelmsford Borough Council (November 2006, Entec UK Ltd)</p> <ul style="list-style-type: none"> <li>• SPA at risk from increased recreational pressure from high density housing and from new industrial development.</li> </ul> <p><b>Habitat Regulations Assessment of the Thurrock LDF Core Strategy.</b> Thurrock Council (October 2007, Scott Wilson)</p> <ul style="list-style-type: none"> <li>• SPA at risk from harmful levels of abstraction due to increased water needs within Thurrock.</li> <li>• SPA at risk from disturbance and damage to habitats through increased recreational pressure.</li> </ul> <p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Some of the options for extraction encroach onto the Colne Estuary SPA and could lead to habitat loss and human disturbance</li> </ul> <p><b>Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme. North East Elsenham.</b> Department for Communities and Local Government (November 2008, Scott Wilson Ltd).</p> <ul style="list-style-type: none"> <li>• Increased water demand as a result of the Elsenham Eco-town may result in increased levels of abstraction that may lead to an adverse impact on the SPA in combination with other plans/projects.</li> </ul>

	Colne Estuary SPA
	<p><b>Maldon District Core Strategy issues and Options. Information for Appropriate Assessment Screening</b> DRAFT 1. Maldon District Council (2007, ARUP)</p> <ul style="list-style-type: none"><li>• Screening identifies numerous policies which could lead to impacts mainly relating to urban regeneration, renewable energy and recreational facilities.</li></ul>

### Site Name: Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)

- Location 004306 E/513823 N
- JNCC Site Code [UK9009244](#)
- Size: 1735.58 ha
- Designation: SPA

Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	
<b>Site Description</b>	The Crouch and Roach Estuaries are located on the coast of south Essex in eastern England. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls along both banks and the river channel. Unlike more extensive estuaries elsewhere in Essex, this leaves a relatively narrow strip of tidal mud which, nonetheless, is used by significant numbers of birds. The site is of importance for wintering waterbirds, especially Dark-bellied Brent Goose <i>Branta b. bernicla</i> . The Crouch and Roach Estuary is an integral component of the phased Mid-Essex Coast SPA.
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Dark-Bellied Brent Goose</a> <i>Branta bernicla bernicla</i></li> </ul> <p>The Crouch and Roach Estuaries SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• 18607 waterfowl (5 year peak mean 30/06/1999)</li> </ul>
<b>Conservation Objectives</b>	<p><b>Conservation objectives for Crouch and Roach Estuaries SPA interest features are as follows:</b></p> <p>Subject to natural change, maintain the habitats for internationally important populations of regularly occurring</p>

Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA													
	<p>migratory bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain the habitats for the internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul>												
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<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key species requirements:</b></p> <ul style="list-style-type: none"> <li>• Dark Bellied Brent Geese wintering habitat is mostly shallow coasts and estuaries with extensive mudflats and intertidal areas. They feed on eelgrass beds and algae on a variety of estuarine</li> </ul>												

Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	
	<p>habitats as well as damp pasture.</p> <p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting</li> </ul> <p><b>To maintain site integrity of estuarine habitats important for birds;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species</li> <li>• Avoid disturbance from noise and/or visual activities</li> </ul> <p><b>To maintain site integrity of terrestrial habitat important for birds (primarily grazing marsh);</b></p> <ul style="list-style-type: none"> <li>• Maintain and enhance water level supply, water quality and water level management in grazing marshes</li> <li>• Minimise/compensate or mitigate habitat loss due to sea defence improvement schemes</li> <li>• Employ appropriate grazing and mowing regimes</li> <li>• Minimise risk of disturbance/damage to wildlife and habitats from recreation</li> </ul>
<b>SAC Condition Assessment</b>	See SSSI condition.
<b>Vulnerabilities (includes</b>	<b>Site-specific vulnerabilities:</b>

Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	
<b>existing pressures and trends)</b>	<ul style="list-style-type: none"> <li>• The site is vulnerable to coastal squeeze and changes to the sediment budget.</li> <li>• Disturbance of feeding and roosting waterfowl is an issue through recreational use of sea wall footpaths.</li> <li>• Habitats are vulnerable to run-off and seepage from adjacent farmland. Farmers encouraged in stewardship schemes to help solve this.</li> </ul> <p><b>Generic vulnerabilities relating to the habitats which support important birds:</b></p> <p><b>Estuarine habitats</b></p> <p><u>Physical loss</u></p> <ul style="list-style-type: none"> <li>• Removal e.g. harvesting, coastal development</li> <li>• Smothering e.g. by artificial structures, disposal of dredge spoil</li> </ul> <p><u>Physical damage</u></p> <ul style="list-style-type: none"> <li>• Siltation e.g. run-off, channel dredging, outfalls</li> <li>• Abrasion e.g. boating, anchoring, trampling</li> <li>• Selective extraction e.g. aggregate dredging, entanglement</li> </ul> <p><u>Non-physical disturbance</u></p> <ul style="list-style-type: none"> <li>• Noise e.g. boating, anchoring, trampling</li> <li>• Visual e.g. recreational activity</li> </ul> <p><u>Toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Introduction of synthetic compounds e.g. pesticides, TBT, PCBs</li> <li>• Introduction of non-synthetic compounds e.g. heavy metals, hydrocarbons</li> <li>• Introduction of radionuclides</li> </ul>

Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA	
	<p><u>Non-toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Nutrient enrichment e.g. agricultural run-off, outfalls</li> <li>• Organic enrichment e.g. mariculture, outfalls</li> <li>• Changes in thermal regime e.g. power stations</li> <li>• Changes in turbidity e.g. run-off, dredging</li> <li>• Changes in salinity e.g. water abstraction, outfalls</li> </ul> <p><u>Biological disturbance</u></p> <ul style="list-style-type: none"> <li>• Introduction of microbial pathogens</li> <li>• Introduction of non-native species and translocation</li> <li>• Selective extraction of species e.g. bait digging, wildfowling, commercial and recreational fishing</li> </ul> <p><b>Grazing Marsh</b></p> <ul style="list-style-type: none"> <li>• Habitat loss through built development</li> <li>• Habitat loss through sea level rise</li> <li>• Inadequate water supply</li> <li>• Impact of agriculture and sewage on water supply</li> <li>• Grassland habitat loss/damage through sea wall improvement</li> <li>• Disposal of channel dredging</li> <li>• Use of herbicides/pesticides</li> </ul>
<b>Landowner/ Management Responsibility</b>	<p>An Essex Estuaries Initiative (<a href="http://www.essexestuaries.org.uk">www.essexestuaries.org.uk</a>) was set up in 1998 to provide an umbrella framework for a variety of coastal initiatives in the locale of the Essex Estuaries European Marine Site (within which Crouch and Roach Estuaries SPA is included). It is a proactive network to facilitate co-ordination and co-operation between organisations responsible for coastal management. Many organisations are involved, in the Essex Estuaries there are 14 statutory authorities directly responsible for the management of the coast.</p> <p>A Coastal Habitat Management Plan (Champ) has also been produced for the Essex Estuaries and covers</p>

	<b>Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) SPA</b>
	<p>the Crouch and Roach Estuaries SPA. <a href="http://www.eclife.naturalengland.org.uk/champs/pilots.asp">http://www.eclife.naturalengland.org.uk/champs/pilots.asp</a></p> <p>A Crouch and Roach Estuary Project was set up in 2003 by a local partnership of stakeholders. The key aim of the project is to provide a co-ordinated approach reflecting local interests to ensure the sustainable use of the estuary. <a href="http://www.essexcc.gov.uk/microsites/crouchandroach/">http://www.essexcc.gov.uk/microsites/crouchandroach/</a></p> <p>A management plan for the estuary has also been produced  <a href="http://www.essexcc.gov.uk/microsites/crouchandroach/Documents/ManagementPlan.pdf">http://www.essexcc.gov.uk/microsites/crouchandroach/Documents/ManagementPlan.pdf</a></p>
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	<p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Numerous options for extraction sites presented, some of which may impact on the SPA.</li> <li>• New aggregate recycling facilities may also impact on the SPA.</li> </ul> <p><b>Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme. North East Elsenham.</b> Department for Communities and Local Government (November 2008, Scott Wilson Ltd).</p> <ul style="list-style-type: none"> <li>• Increased water demand as a result of the Elsenham Eco-town may result in increased levels of abstraction that may lead to an adverse impact in combination with other plans/projects.</li> </ul> <p><b>Maldon District Core Strategy issues and Options. Information for Appropriate Assessment Screening.</b>DRAFT 1. Maldon District Council (2007, ARUP)</p> <ul style="list-style-type: none"> <li>• Screening identifies numerous policies which could lead to impacts mainly relating to urban regeneration, renewable energy and recreational facilities.</li> </ul>

**Site Name: Blackwater Estuary (Mid-Essex Coast Phase 4)**

- **Location:** 005159E/514513N
- **JNCC Site Code:** [UK9009245](#)
- **Size:** 4395.15ha
- **Designation:** SPA

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
<b>Site Description</b>	<p>The Blackwater Estuary is located on the coast of Essex in eastern England. It is the largest estuary in Essex and is one of the largest estuarine complexes in East Anglia. Its mud-flats are fringed by saltmarsh on the upper shores, with shingle, shell banks and offshore islands a feature of the tidal flats. The surrounding terrestrial habitats; the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland, are of high conservation interest. The diversity of estuarine habitats results in the sites being of importance for a wide range of overwintering waterbirds, including raptors, geese, ducks and waders. The site is also important in summer for breeding terns. The Blackwater Estuary is an integral component of the phased Mid-Essex Coast SPA.</p> <p>The site includes the subsumed SPA of Old Hall Marshes, which was subject to separate classification.</p>
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>During the breeding season the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Little Tern</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a></li> <li>• <a href="#">Golden Plover</a></li> <li>• <a href="#">Hen Harrier</a></li> <li>• <a href="#">Ruff</a></li> </ul>

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
	<p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>On passage:</p> <ul style="list-style-type: none"> <li>• <a href="#">Ringed Plover</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Black Tailed Godwit</a></li> <li>• <a href="#">Dark Bellied Brent Goose</a></li> <li>• <a href="#">Dunlin</a></li> <li>• <a href="#">Grey Plover</a></li> <li>• <a href="#">Redshank</a></li> <li>• <a href="#">Ringed Plover</a></li> <li>• <a href="#">Shelduck</a></li> </ul> <p>The Blackwater Estuary SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 109,815 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<p><b>Conservation objectives for the Blackwater Estuary SPA interest features are as follows</b></p> <p>Subject to natural change, maintain habitats for the internationally important populations of the regularly occurring Annex I bird species in favourable condition, in particular;</p> <ul style="list-style-type: none"> <li>• Sand and gravel shores</li> <li>• Shallow coastal waters</li> <li>• Intertidal mudflats and sandflats</li> <li>• Grassland/grazing marsh</li> </ul>

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA													
	<ul style="list-style-type: none"> <li>• Saltmarsh</li> </ul> <p>Subject to natural change, maintain habitats for internationally important populations of the regularly occurring migratory bird species, in particular;</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain the habitats for internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Shallow coastal waters</li> <li>• Grassland/grazing marsh</li> </ul>												
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<b>Key Environmental Conditions (factors that</b>	<p><b>Key species requirements</b></p> <ul style="list-style-type: none"> <li>• Little Tern breeding populations nest on the coast utilising sand and shingle beaches and spits as</li> </ul>												

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
<b>maintain site integrity</b>	<p>well as tiny islets of sand/rock close inshore.</p> <ul style="list-style-type: none"> <li>• The preferred habitat of Avocets during winter is estuarine systems where substrate is largely comprised of fine silt.</li> <li>• Grassland is the preferred feeding habitat of the Golden Plover with rich permanent pastures preferred. The inter-tidal zone is also an important feeding habitat.</li> <li>• Hen Harriers move to the lowlands over winter, particularly the coast and are known to hunt especially over saltmarsh, grazing marshes and lowland farmland.</li> <li>• Ruff use a wide range of habitats in winter including coastal marsh and intertidal zones</li> <li>• Ringed Plovers feed on invertebrates on sand and shingle shores, sandbanks and mudflats as well as saltmarsh, short grassland, flooded fields and the shores of artificial coastal habitats.</li> <li>• Black Tailed Godwits feed on worms whilst the tide is out and roost in damp pasture. The main winter concentrations are found on muddy estuaries</li> <li>• Dark Bellied Brent Geese wintering habitat is mostly shallow coasts and estuaries with extensive mudflats and intertidal areas. They feed on eelgrass beds and algae on a variety of estuarine habitats as well as damp pasture.</li> <li>• Dunlin overwinter on estuaries and open coasts, preferring finer and muddier sediments for feeding</li> <li>• Grey Plover are dependent on muddy estuaries and other soft sediment coastlines in winter.</li> <li>• Redshank populations are predominantly within estuary systems in winter.</li> <li>• Shelduck gather in major aggregations in late summer to moult. Muddy and sandy estuaries are favoured.</li> </ul> <p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable</li> </ul>

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
	<p>for bird feeding, nesting and roosting.</p> <p><b>To maintain site integrity of estuarine habitats important for birds;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities.</li> </ul> <p><b>To maintain site integrity of terrestrial habitat important for birds (primarily grazing marsh);</b></p> <ul style="list-style-type: none"> <li>• Maintain and enhance water level supply, water quality and water level management in grazing marshes</li> <li>• Minimise/compensate or mitigate habitat loss due to sea defence improvement schemes</li> <li>• Employ appropriate grazing and mowing regimes</li> <li>• Minimise risk of disturbance/damage to wildlife and habitats from recreation.</li> </ul>
<b>SPA Condition Assessment</b>	See SSSI condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Site specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• The main threat to the site is erosion of intertidal habitats due to a combination of sea level rise and isostatic forces operating on the land mass of Great Britain. The situation is worsened by ever increasing winter storm events, whilst the hard sea walls along this coastline are preventing the saltmarsh and intertidal areas from migrating inland. This situation is being addressed by alternative flood defence techniques. The shoreline management plan for the Essex Coast is currently being revised and will address such issues.</li> <li>• Nutrient enrichment occurs from agricultural run-off and treated sewage effluent.</li> </ul>

	<b>Blackwater Estuary (Mid-Essex Coast Phase 4) SPA</b>
	<ul style="list-style-type: none"> <li>• Water based recreation</li> <li>• Drought has lowered the water tables in grazing marshes.</li> </ul> <p><b>Species vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• Little Terns are highly vulnerable to human disturbance which can lead to nest failure. They are also threatened by habitat destruction e.g. development/reclamation of coastal habitat and pesticide pollution.</li> <li>• Dunlin - in winter this species is restricted to estuaries so is vulnerable to any changes in this habitat e.g. through land reclamation and the invasion of alien plant species (e.g. <i>Spartina anglica</i> which has spread on British mudflats has resulted in a decrease in the size of feeding areas available). Also threatened by disturbance on intertidal mudflats from construction work and recreation.</li> </ul> <p><b>Generic vulnerabilities relating to the habitats which support important birds:</b></p> <p><b>Estuarine habitats</b></p> <p><u>Physical loss</u></p> <ul style="list-style-type: none"> <li>• Removal e.g. harvesting, coastal development</li> <li>• Smothering e.g. by artificial structures, disposal of dredge spoil</li> </ul> <p><u>Physical damage</u></p> <ul style="list-style-type: none"> <li>• Siltation e.g. run-off, channel dredging, outfalls</li> <li>• Abrasion e.g. boating, anchoring, trampling</li> <li>• Selective extraction e.g. aggregate dredging, entanglement</li> </ul> <p><u>Non-physical disturbance</u></p> <ul style="list-style-type: none"> <li>• Noise e.g. boating, anchoring, trampling</li> <li>• Visual e.g. recreational activity</li> </ul>

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
	<p><u>Toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Introduction of synthetic compounds e.g. pesticides, TBT, PCBs</li> <li>• Introduction of non-synthetic compounds e.g. heavy metals, hydrocarbons</li> <li>• Introduction of radionuclides</li> </ul> <p><u>Non-toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Nutrient enrichment e.g. agricultural run-off, outfalls</li> <li>• Organic enrichment e.g. mariculture, outfalls</li> <li>• Changes in thermal regime e.g. power stations</li> <li>• Changes in turbidity e.g. run-off, dredging</li> <li>• Changes in salinity e.g. water abstraction, outfalls</li> </ul> <p><u>Biological disturbance</u></p> <ul style="list-style-type: none"> <li>• Introduction of microbial pathogens</li> <li>• Introduction of non-native species and translocation</li> <li>• Selective extraction of species e.g. bait digging, wildfowling, commercial and recreational fishing</li> </ul> <p><b>Grazing Marsh</b></p> <ul style="list-style-type: none"> <li>• Habitat loss through built development</li> <li>• Habitat loss through sea level rise</li> <li>• Inadequate water supply</li> <li>• Impact of agriculture and sewage on water supply</li> <li>• Grassland habitat loss/damage through sea wall improvement</li> <li>• Disposal of channel dredging</li> <li>• Use of herbicides/pesticides</li> </ul>

Blackwater Estuary (Mid-Essex Coast Phase 4) SPA	
<b>Landowner/ Management Responsibility</b>	<p>An Essex Estuaries Initiative (<a href="http://www.essexestuaries.org.uk">www.essexestuaries.org.uk</a> ) was set up in 1998 to provide an umbrella framework for a variety of coastal initiatives in the locale of the Essex Estuaries European Marine Site (within which the Blackwater Estuary SPA is included). It is a proactive network to facilitate co-ordination and co-operation between organisations responsible for coastal management. Many organisations are involved, in the Essex Estuaries there are 14 statutory authorities directly responsible for the management of the coast.</p> <p>A Coastal Habitat Management Plan (Champ) has also been produced for the Essex Estuaries and covers the Blackwater Estuary SPA. <a href="http://www.eclife.naturalengland.org.uk/champs/pilots.asp">http://www.eclife.naturalengland.org.uk/champs/pilots.asp</a></p> <p>A management plan for the estuary has also been produced <a href="http://www.maldon.gov.uk/NR/rdonlyres/ED294E00-A14C-4B08-B676-3AB820D47E49/6872/BlackwaterPlanMaster.pdf">http://www.maldon.gov.uk/NR/rdonlyres/ED294E00-A14C-4B08-B676-3AB820D47E49/6872/BlackwaterPlanMaster.pdf</a></p> <p>The Blackwater Estuary is also designated as a National Nature Reserve. Two areas of the reserve are managed 1) Old Hall Marshes which is managed by the RSPB and 2) Tollesbury Flats which is managed by Natural England.</p>
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>East of England Regional Spatial Strategy: Habitats Directive Assessment.</b> Government Office for the East of England. ERM 2006</p> <ul style="list-style-type: none"> <li>• Report gives mention to possible effects on through housing growth impacts e.g. effluent discharge impacts. Also mentions that Natura 2000 sites to be considered in more detail at LDD level.</li> </ul> <p><b>Appropriate Assessment of the Draft South East Plan</b> , South East England Regional Assembly, (October 2006, Scott Wilson, Levett – Thrivel)</p> <ul style="list-style-type: none"> <li>• Plan notes that the site is at risk from increased recreational pressure and increased effluent discharge associated with developments.</li> </ul> <p><b>Appropriate Assessment of the Chelmsford Core Strategy and Development Control Policies Submission Document DPD.</b> Chelmsford Borough Council (November 2006, Entec UK Ltd)</p>

	Blackwater Estuary (Mid-Essex Coast Phase 4) SPA
	<ul style="list-style-type: none"> <li>• SPA at risk from increased recreational pressure from high density housing and from new industrial development.</li> </ul> <p><b>Habitat Regulations Assessment of the Thurrock LDF Core Strategy.</b> Thurrock Council (October 2007, Scott Wilson)</p> <ul style="list-style-type: none"> <li>• SPA at risk from harmful levels of abstraction due to increased water needs within Thurrock.</li> <li>• SPA at risk from disturbance and damage to habitats through increased recreational pressure.</li> </ul> <p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Numerous options for extraction sites presented, some of which may impact on the SPA.</li> <li>• New aggregate recycling facilities may also impact on the SPA.</li> </ul> <p><b>Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme. North East Elsenham.</b> Department for Communities and Local Government (November 2008, Scott Wilson Ltd).</p> <ul style="list-style-type: none"> <li>• Increased water demand as a result of the Elsenham Eco-town may result in increased levels of abstraction that may lead to an adverse impact in combination with other plans/projects.</li> </ul> <p><b>Maldon District Core Strategy issues and Options. Information for Appropriate Assessment Screening DRAFT 1.</b> Maldon District Council (2007, ARUP)</p> <ul style="list-style-type: none"> <li>• Screening identifies numerous policies which could lead to impacts mainly relating to urban regeneration, renewable energy and recreational facilities.</li> </ul>

### Site Name: Foulness (Mid-Essex Coast Phase 5)

- Location: 005517E/513426N
- JNCC Site Code: [UK9009246](#)
- Size: 10968.9
- Designation: SPA

Foulness (Mid-Essex Coast Phase 5) SPA	
<b>Site Description</b>	Foulness is located on the coast of Essex, on the east coast of England north of the mouth of the Thames estuary. The site is part of an open coast estuarine system comprising grazing marsh, saltmarsh, intertidal mud-flats, cockle-shell banks and sand-flats. It includes one of the three largest continuous sand-silt flats in the UK. The diversity of high quality coastal habitats present support important populations of breeding, migratory and wintering waterbirds, notably very important concentrations of Dark-bellied Brent Goose <i>Branta bernicla bernicla</i> . Foulness is an integral component of the phased Mid-Essex Coast SPA.
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>During the breeding season the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a></li> <li>• <a href="#">Common Tern</a></li> <li>• <a href="#">Little Tern</a></li> <li>• <a href="#">Sandwich Tern</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a></li> <li>• <a href="#">Bar-tailed Godwit</a></li> <li>• <a href="#">Golden Plover</a></li> <li>• <a href="#">Hen Harrier</a></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the</p>

Foulness (Mid-Essex Coast Phase 5) SPA	
	<p>following migratory species:</p> <p>On passage:</p> <ul style="list-style-type: none"> <li>• <a href="#">Redshank</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Dark Bellied Brent Goose</a></li> <li>• <a href="#">Grey Plover</a></li> <li>• <a href="#">Knot</a></li> <li>• <a href="#">Oystercatcher</a></li> </ul> <p>The Foulness SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 107,468 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<p><b>Conservation objectives for the Foulness SPA interest features are as follows;</b></p> <p>Subject to natural change, maintain habitats for the internationally important populations of the regularly occurring Annex I bird species in favourable condition, in particular;</p> <ul style="list-style-type: none"> <li>• Shell, sand and gravel shores</li> <li>• Shallow coastal waters</li> <li>• Intertidal mudflats and sandflats</li> <li>• Saltmarsh</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain habitats for internationally important populations of the regularly occurring migratory bird species, in particular;</p>

Foulness (Mid-Essex Coast Phase 5) SPA													
	<ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain the habitats for internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Shallow coastal waters</li> <li>• Grassland/grazing marsh</li> </ul>												
<b>Component SSSIs</b>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">SPA component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Foulness SSSI (33 units)</td> <td>77.94%</td> <td>0.30%</td> <td>0.80%</td> <td>20.96%</td> <td>0.0%</td> </tr> </tbody> </table>	SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Foulness SSSI (33 units)	77.94%	0.30%	0.80%	20.96%	0.0%
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<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key species requirements;</b></p> <ul style="list-style-type: none"> <li>• The preferred habitat for breeding Avocets is shallow brackish coastal lagoons with bare or sparsely vegetated low islands. In Essex they also breed along the margins of borrow dykes and in wet fields grazed by sheep. The preferred habitat of Avocets during winter is estuarine systems where substrate is largely comprised of fine silt</li> </ul>												

	Foulness (Mid-Essex Coast Phase 5) SPA
	<ul style="list-style-type: none"> <li>• Little Tern breeding populations nest on the coast utilising sand and shingle beaches and spits as well as tiny islets of sand/rock close inshore.</li> <li>• Common Tern breeds along the coast on small rocky islets, shingle beaches, sand spits and dunes as well as amongst short vegetation.</li> <li>• Sandwich Tern breeds on coastal shingle beaches, sand dunes and on offshore islets.</li> <li>• Bar-Tailed Godwits are dependent on coastal habitats in winter feeding mainly on worms both on sandy and muddy shores</li> <li>• Grassland is the preferred feeding habitat of the Golden Plover with rich permanent pastures preferred. The inter-tidal zone is also an important feeding habitat.</li> <li>• Hen Harriers move to the lowlands over winter, particularly the coast and are known to hunt especially over saltmarsh, grazing marshes and lowland farmland.</li> <li>• Dark Bellied Brent Geese wintering habitat is mostly shallow coasts and estuaries with extensive mudflats and intertidal areas. They feed on eelgrass beds and algae on a variety of estuarine habitats as well as damp pasture.</li> <li>• Grey Plover are dependent on muddy estuaries and other soft sediment coastlines in winter.</li> <li>• Redshank populations are predominantly within estuary systems in winter.</li> <li>• Wintering Knot are almost exclusively dependent on estuarine habitats and are specialist feeders on bivalves molluscs e.g. cockles.</li> <li>• The Oystercatcher is associated with estuaries in winter and can be found feeding on rocky, sandy and muddy shores. Particularly favours cockles.</li> </ul> <p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting.</li> </ul>

Foulness (Mid-Essex Coast Phase 5) SPA	
	<p><b>To maintain site integrity of estuarine habitats important for birds;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities.</li> </ul> <p><b>To maintain site integrity of terrestrial habitat important for birds (primarily grazing marsh);</b></p> <ul style="list-style-type: none"> <li>• Maintain and enhance water level supply, water quality and water level management in grazing marshes</li> <li>• Minimise/compensate or mitigate habitat loss due to sea defence improvement schemes</li> <li>• Employ appropriate grazing and mowing regimes</li> <li>• Minimise risk of disturbance/damage to wildlife and habitats from recreation.</li> </ul>
<b>SPA Condition assessment</b>	See SSSI condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Site-specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• Much of the area is owned by the ministry of defence and is not therefore subject to development pressures or public disturbance.</li> <li>• Offshore dredging may have impacts</li> <li>• Natural processes are causing erosion of saltmarsh</li> <li>• The site includes areas of grazing marsh and ditches. A combination of lower rainfall and improved drainage to facilitate arable production means that grazing marshes are becoming too dry.</li> <li>• The Essex Sea Fisheries committee control the cockle fishery through regulatory orders (The cockle beds present support internationally important numbers of wading birds)</li> </ul>

	Foulness (Mid-Essex Coast Phase 5) SPA
	<p><b>Species specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• The Sandwich Tern is particularly vulnerable to human disturbance (e.g. from tourists) especially near breeding colonies on beaches early in the breeding season. It is also sensitive to disturbance from coastal wind farms (wind turbines). It is threatened by the loss or degradation of its favoured breeding habitats through inundation, wind-blown sand and erosion, and has suffered previous local declines from to exposure to bio-accumulated organochlorine pollutants in marine fish.</li> <li>• During the breeding season the Common Tern is vulnerable to human disturbance at nesting colonies (e.g. from off-road vehicles, recreation, motor-boats, personal watercraft and dogs) and to the flooding of nest sites as a result of naturally fluctuating water levels. On its breeding grounds the species is also threatened by habitat loss as a result of coastal development, erosion, vegetation overgrowth (rapid vegetation succession encroaching upon nesting habitats) and chemical pollution (which may also result in eggshell thinning ) it suffers predation at nesting colonies from rats (especially on islands) and from expanding populations of large gull species such as Herring Gulls <i>Larus argentatus</i>(gulls may also prevent the species from nesting in the area by colonising it first)</li> <li>• Little Terns are highly vulnerable to human disturbance which can lead to nest failure. They are also threatened by habitat destruction e.g. development/reclamation of coastal habitat and pesticide pollution.</li> <li>• Internationally, Bar-Tailed Godwits are threatened by the degradation of foraging sites due to land reclamation, pollution, and human disturbance</li> </ul> <p><b>Generic vulnerabilities relating to the habitats which support important birds:</b></p> <p><b>Estuarine habitats</b></p> <p><u>Physical loss</u></p> <ul style="list-style-type: none"> <li>• Removal e.g. harvesting, coastal development</li> </ul>

	Foulness (Mid-Essex Coast Phase 5) SPA
	<ul style="list-style-type: none"> <li>• Smothering e.g. by artificial structures, disposal of dredge spoil</li> </ul> <p><u>Physical damage</u></p> <ul style="list-style-type: none"> <li>• Siltation e.g. run-off, channel dredging, outfalls</li> <li>• Abrasion e.g. boating, anchoring, trampling</li> <li>• Selective extraction e.g. aggregate dredging, entanglement</li> </ul> <p><u>Non-physical disturbance</u></p> <ul style="list-style-type: none"> <li>• Noise e.g. boating, anchoring, trampling</li> <li>• Visual e.g. recreational activity</li> </ul> <p><u>Toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Introduction of synthetic compounds e.g. pesticides, TBT, PCBs</li> <li>• Introduction of non-synthetic compounds e.g. heavy metals, hydrocarbons</li> <li>• Introduction of radionuclides</li> </ul> <p><u>Non-toxic contamination</u></p> <ul style="list-style-type: none"> <li>• Nutrient enrichment e.g. agricultural run-off, outfalls</li> <li>• Organic enrichment e.g. mariculture, outfalls</li> <li>• Changes in thermal regime e.g. power stations</li> <li>• Changes in turbidity e.g. run-off, dredging</li> <li>• Changes in salinity e.g. water abstraction, outfalls</li> </ul> <p><u>Biological disturbance</u></p> <ul style="list-style-type: none"> <li>• Introduction of microbial pathogens</li> <li>• Introduction of non-native species and translocation</li> <li>• Selective extraction of species e.g. bait digging, wildfowling, commercial and recreational fishing</li> </ul>

Foulness (Mid-Essex Coast Phase 5) SPA	
	<p><b>Grazing Marsh</b></p> <ul style="list-style-type: none"> <li>• Habitat loss through built development</li> <li>• Habitat loss through sea level rise</li> <li>• Inadequate water supply</li> <li>• Impact of agriculture and sewage on water supply</li> <li>• Grassland habitat loss/damage through sea wall improvement</li> <li>• Disposal of channel dredging</li> <li>• Use of herbicides/pesticides</li> </ul>
<b>Landowner/ Management Responsibility</b>	<p>An Essex Estuaries Initiative (<a href="http://www.essexestuaries.org.uk">www.essexestuaries.org.uk</a> ) was set up in 1998 to provide an umbrella framework for a variety of coastal initiatives in the locale of the Essex Estuaries European Marine Site (within which the Foulness SPA is included). It is a proactive network to facilitate co-ordination and co-operation between organisations responsible for coastal management. Many organisations are involved, in the Essex Estuaries there are 14 statutory authorities directly responsible for the management of the coast.</p> <p>A Coastal Habitat Management Plan (Champ) has also been produced for the Essex Estuaries and covers the Foulness SPA. <a href="http://www.eclife.naturalengland.org.uk/champs/pilots.asp">http://www.eclife.naturalengland.org.uk/champs/pilots.asp</a></p> <p>A management plan has been produced for the Crouch and Roach Estuaries, Foulness SPA falls within the remit of this plan.</p>
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>East of England Regional Spatial Strategy: Habitats Directive Assessment.</b> Government Office for the East of England. ERM 2006</p> <ul style="list-style-type: none"> <li>• Report gives mention to possible effects on through housing growth impacts e.g. effluent discharge impacts. Also mentions that Natura 2000 sites to be considered in more detail at LDD level.</li> </ul> <p><b>Appropriate Assessment of the Draft South East Plan</b> , South East England Regional Assembly, (October</p>

	Foulness (Mid-Essex Coast Phase 5) SPA
	<p>2006, Scott Wilson, Levett – Thrivel)</p> <ul style="list-style-type: none"> <li>• Plan notes that the site is at risk from increased effluent discharge associated with developments.</li> </ul> <p><b>Appropriate Assessment of the Chelmsford Core Strategy and Development Control Policies Submission Document DPD.</b> Chelmsford Borough Council (November 2006, Entec UK Ltd)</p> <ul style="list-style-type: none"> <li>• SPA at risk from new industrial development.</li> </ul> <p><b>Habitat Regulations Assessment of the Thurrock LDF Core Strategy.</b> Thurrock Council (October 2007, Scott Wilson)</p> <ul style="list-style-type: none"> <li>• SPA at risk from harmful levels of abstraction due to increased water needs within Thurrock.</li> </ul> <p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Numerous options for extraction sites presented, some of which may impact on the SPA.</li> <li>• New aggregate recycling facilities may also impact on the SPA.</li> </ul> <p><b>Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns Programme. North East Elsenham.</b> Department for Communities and Local Government (November 2008, Scott Wilson Ltd).</p> <ul style="list-style-type: none"> <li>• Increased water demand as a result of the Elsenham Eco-town may result in increased levels of abstraction that may lead to an adverse impact in combination with other plans/projects.</li> </ul> <p><b>Maldon District Core Strategy issues and Options. Information for Appropriate Assessment Screening DRAFT 1.</b> Maldon District Council (2007, ARUP)</p> <ul style="list-style-type: none"> <li>• Screening identifies numerous policies which could lead to impacts mainly relating to urban regeneration, renewable energy and recreational facilities.</li> </ul>

## Site Name: Abberton Reservoir

- Location: 005222E/514937N
- JNCC Site Code: [UK9009141](#)
- Size: 726.2 ha
- Designation: SPA

Abberton Reservoir SPA	
<b>Site Description</b>	<p>Abberton Reservoir is located close to the coast of Essex in eastern England. It is a large, shallow, freshwater storage reservoir built in a long, shallow valley and is the largest freshwater body in Essex. It is one of the most important reservoirs in Britain for wintering wildfowl, with a key role as a roost for wildfowl and waders feeding in adjacent estuarine areas. The site is also important for winter feeding and autumn moulting of waterbirds. The margins of parts of the reservoir have well-developed plant communities that provide important opportunities for feeding, nesting and shelter. Abberton Reservoir is important especially as an autumn arrival area for waterbirds that subsequently spend the winter elsewhere.</p>
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Golden Plover</a></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>During the breeding season:</p> <ul style="list-style-type: none"> <li>• <a href="#">Cormorant</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Gadwall</a></li> </ul>

Abberton Reservoir SPA													
	<ul style="list-style-type: none"> <li>• <a href="#">Shoveler</a></li> <li>• <a href="#">Teal</a></li> <li>• <a href="#">Wigeon</a></li> <li>• <a href="#">Pochard</a></li> <li>• <a href="#">Tufted Duck</a></li> <li>• <a href="#">Goldeneye</a></li> <li>• <a href="#">Coot</a></li> <li>• <a href="#">Great Crested Grebe</a></li> <li>• Mute Swan</li> </ul> <p>Abberton Reservoir also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 39,155 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>												
<b>Conservation Objectives</b>	<p><b>Conservation objectives for Abberton Reservoir SPA:</b></p> <ul style="list-style-type: none"> <li>• Subject to natural change, maintain habitats for the internationally important populations of the regularly occurring Annex I bird species in favourable condition.</li> <li>• Subject to natural change, maintain habitats for internationally important populations of the regularly occurring migratory bird species.</li> <li>• Subject to natural change, maintain the habitats for internationally important assemblages of waterfowl in favourable condition.</li> </ul>												
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Abberton Reservoir SPA						
	Abberton Reservoir SSSI	100.00%	0.00%	0.00%	0.00%	0.00%
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key species requirements;</b></p> <ul style="list-style-type: none"> <li>• Golden Plover utilize the damp grassland/pasture surrounding the reservoir for feeding in winter</li> <li>• Cormorants breeding at Abberton Reservoir are unique in that the birds nest in trees rather than on customary cliff ledges or rocky inlets</li> <li>• Great Crested Grebe, Gadwall, Shoveler, Teal, Wigeon, Pochard, Tufted Duck, Goldeneye, Coot and Mute Swan all use the reservoir as an autumn arrival point and for moulting, feeding and roosting over winter.</li> </ul> <p><b>Site specific requirements;</b></p> <ul style="list-style-type: none"> <li>• Sympathetic management of water levels within the main water body is necessary for the maintenance of optimal water depths throughout the year. For example, the presence of extensive shallow water and wet marginal substrates will provide the feeding conditions required by a variety of wintering, passage and breeding wildfowl, such as dabbling ducks and waders, , whilst other species may require areas of water at least 3 metres in depth.</li> <li>• The protection of appropriate water quality is important for maintaining aquatic habitats and the range of species associated with them.</li> <li>• Resist development of land that would reduce the amount of open water below that necessary to maintain nature conservation interest.</li> <li>• Eradicate non-native species where they threaten important nature conservation interests</li> <li>• Standing waters and their surroundings are often also a popular environment for recreational activities such as angling and boating which should be managed sympathetically to avoid conflict with the management of the waterbody for nature conservation. Large areas of wetland should be kept free from disturbance during the breeding season, as well as during the winter months.</li> <li>• Other wetland habitats surrounding the open water may require some active management. For example, management should ensure that appropriate nesting and feeding conditions are</li> </ul>					

	<b>Abberton Reservoir SPA</b>
	maintained across the site for breeding, wintering and passage birds.
<b>SPA Condition Assessment</b>	See SSSI condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p><b>Site specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• Abberton Reservoir is a public water supply reservoir. Reduced water availability, and increased demand, in recent years has led to generally low water levels; greater numbers of waders therefore use the site, and as a result no decrease in wildfowl has been attributed to low water levels. The possibility of raising the reservoir level to secure water supply is under consideration, and the requirement of waterfowl are a primary consideration of the associated EIA.</li> <li>• Increases in the amount of nutrients within the waterbody (as a result of pollution from direct discharges and also from diffuse sources resulting from land management practices within the wider catchment) can lead to a loss of aquatic plants in favour of algae and impact upon invertebrate species, both of which are important food sources for a range of wetland birds.</li> <li>• Water entering the site has elevated nitrate levels, leading in most summers to algal blooms, but as of yet there is no evidence of impacts on wildlife.</li> <li>• Changes to the amount of water within the waterbody (by abstracting water from inflowing streams or raising the water level) can also alter nutrient regimes, as well as change the available area of some habitats. Increases in the amount of sediment entering a waterbody may smother stony beds, reduce water depth in shallow waterbodies and also increase the amount of nutrients present and should therefore be avoided.</li> <li>• Other activities that can lead to a decrease in aquatic plants in favour of algae include the control or removal of the natural aquatic vegetation, or the intentional or accidental introduction of species such as bottom feeding coarse fish that uproot plants and disturb sediments on the bottom of the waterbody.</li> <li>• Artificial waterbodies are susceptible to the introduction of invasive species such as non-native crayfish or plant species, for example, Australian swamp stonecrop, and some management may be necessary to control these where they occur.</li> <li>• Recreational disturbance may impact on important bird assemblages.</li> </ul>

Abberton Reservoir SPA	
<b>Landowner/ Management Responsibility</b>	Essex and Suffolk Water own the reservoir and have a consultative committee which addresses conservation issues at all its sites. The Abberton Reserve Committee (involving Essex Wildlife Trust and Natural England) addresses local issues.
<b>HRA/AA Studies undertaken that address this site</b>	<p><b>East of England Regional Spatial Strategy: Habitats Directive Assessment.</b> Government Office for the East of England. ERM 2006</p> <ul style="list-style-type: none"> <li>• Report gives mention to possible effects on through housing growth impacts. Also mentions that Natura 2000 sites to be considered in more detail at LDD level. Abberton Reservoir mentioned with regards to proposed raising of water levels in order to cater for increased housing demand and effects of climate change. Increasing the water levels is predicted to benefit to wildlife in the long term.</li> </ul> <p><b>Habitat Regulations Assessment of the Thurrock LDF Core Strategy.</b> Thurrock Council (October 2007, Scott Wilson)</p> <ul style="list-style-type: none"> <li>• Abberton reservoir mentioned with regards to proposed raising of water level. Increasing the water levels is predicted to benefit to wildlife in the long term.</li> </ul> <p><b>Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report.</b> Essex County Council. (January 2009, Eunomia Research and Consulting).</p> <ul style="list-style-type: none"> <li>• Numerous options for extraction sites presented, some of which may impact on the SPA.</li> <li>• New aggregate recycling facilities may also impact on the SPA.</li> </ul>

### Site Name: Outer Thames Estuary

- **Location:** 1154431E/51342546N
- **JNCC Site Code:** Not yet allocated
- **Size:** 393734.18 ha
- **Designation:** potential SPA

The majority of information for the Outer Thames SPA has been obtained from Natural England Consultation documents found at the following location: <http://www.naturalengland.org.uk/ourwork/marine/sacconsultation/default.aspx>

Outer Thames Estuary SPA	
<b>Site Description</b>	The Outer Thames Estuary SPA is located in the southern part of the North Sea on the east coast of England between the counties of Essex (on the north side) and Kent (on the south) and extends as a broad opening into the North Sea. The site is the most important site in the UK for Red-throated Divers ( <i>Gavia stellata</i> ) that are not breeding (the estuary supports on average 38% of the British wintering population) and comprises areas of shallow and deeper water, high tidal current streams and a range of mobile sediments (mud, silt, sand and gravel), including sandbanks and channels. As most of the SPA lies beyond the mean low water mark, it is likely to be in a relatively natural state, other than localised impacts of maintenance dredging, oil and gas exploration, wind farm construction and commercial fishing. The sandbanks of the estuary provide important nursery and feeding grounds for many fish species, including herring and sprats, which are among the main prey species of the Red-throated Diver.
<b>Qualifying Features</b>	<p>This site qualifies under <b>Article 4.1</b> of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:</p> <p>Over winter;</p> <p><b>Red-throated Diver</b> - 6486 individuals wintering between 1989-2006/07. The site is the most important wintering site for this species in the UK and represents at least 1% of the GB wintering population.</p>

Outer Thames Estuary SPA	
<b>Conservation Objectives</b>	<p>Subject to natural change, maintain in favourable condition the internationally important populations of the regularly occurring Birds Directive Annex I Species:</p> <p>Red-throated Diver – and its supporting habitats and species.</p> <p>Relevant habitats include shallow coastal waters and areas in the vicinity of sub-tidal sandbanks.</p>
<b>Component SSSIs</b>	None
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p>Wintering Red-throated Divers occur mainly in waters between 0-20m deep (less frequently in depths of around 30m) and in areas with extensive sandy substrate. Sublittoral, shallow (&lt;20m) sandbank habitat is therefore very important for this species.</p> <p>There is also some evidence of association with areas of salinity change (for example, where low salinity river water meets higher salinity sea level water). Such areas tend to fluctuate with state of tide, volume of river flow and wind conditions.</p> <p>The diet of the Red-throated Diver is principally small fish of a variety of species (particularly of the cod family, herring and sprats) and there is evidence to suggest that, in some areas, the higher numbers of birds are associated with shoals of sprats.</p>
<b>SPA Condition Assessment</b>	N/A
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>Red-throated Divers in the Outer Thames Estuary are sensitive to the following:</p> <p><b>Physical loss of supporting habitat</b> (for example, offshore development, disposal of dredge spoil) Physical loss by removal or smothering of any of the habitats on which Red-throated Divers depend may result in the loss of foraging sites and, therefore, the reduction of a food resource for the overwintering population.</p>

	<b>Outer Thames Estuary SPA</b>
	<p><b>Physical damage to habitat</b> (for example, siltation, abrasion, selective extraction)                      Red-throated Divers are known to associate with sandbank features and, although benthic sandbank communities are in general relatively resilient to physical damage, repeated damage to the habitats on which the species depends may result in a reduction in their value as foraging sites for the overwintering population.</p> <p><b>Non physical disturbance</b>                      Red-throated Divers are highly sensitive to non-physical disturbance by noise and visual presence during the winter. Feeding can be disturbed by movements of objects (for example, boats, wind turbine rotors) and increases in noise disturbance displacing birds from their feeding grounds. This can cause birds to cease feeding or fly away and, in response, they could a) increase their energy requirements at their present (disturbed) feeding sites or b) move to an alternative less favoured feeding or roosting site. Such a response affects energy budgets and food intake and possibly survival. Over-wintering birds, which are frequently subject to harsh weather conditions and must lay down fat reserves in order to migrate to breeding grounds, are particularly susceptible to adverse effects resulting from disturbance.</p> <p><b>Toxic contamination of Red-throated Divers and their supporting habitats</b>                      A number of operators will discharge effluent upstream into the Thames Estuary and into the adjacent coastal waters (including low levels of radionuclides and heavy metals). Significant dilution of these low inputs together with high energy environments associated with sandbanks mean that the habitat has a moderate sensitivity to toxic contamination from these sources.</p> <p>In the case of the Red-throated Diver, the sensitivity to synthetic chemicals such as PCBs is moderate. PCBs accumulate through the food chain in the tissues of marine organisms and could be considerable once they reach the fish on which Red-throated Divers feed. If marine pollution were to occur there is the potential for exposure to PCBs to change.</p> <p>Large oil and chemical spills affecting shallow sandbank habitats can have a detrimental effect on bird populations by significantly affecting food sources and presenting a threat to diving and feeding seabirds.</p>

	Outer Thames Estuary SPA
	<p>Birds are particularly vulnerable when moulting. Dispersants used to disperse the oil may also be harmful to the species. Princes Channel, which runs through the southern area of the Outer Thames SPA, carries a significant amount of vessel traffic in and out of the ports of the Thames Estuary. In addition, Fisherman's Gat is an active commercial shipping channel and smaller vessels use the shallower inshore channels across the site. The risk of contamination by accidental spillages of fuel or cargo is therefore increased and a small level of contamination will exist as a result of normal shipping activities. Large ports in the area also increase the risk of exposure.</p> <p><b>Non-toxic contamination of Red-Throated Divers and their supporting habitats</b>            Non-toxic contamination through nutrient loading, organic loading and changes to thermal regime could impact upon prey species and distribution. Non toxic contamination through the impact from an oil spill could be significant. Oil on the feathers of birds could lead to loss of insulation, reduced buoyancy and possible drowning.</p> <p><b>Selective extraction of prey species</b>            Removal of fish species and larger molluscs, for example, can have significant impacts upon the structure and functioning of benthic communities over and above the physical effects of fishing methods, particularly as some fish species fill upper roles in the trophic web. In addition, it has the potential to directly remove prey species. The mechanisms for these pressures to impact upon Red-throated Divers may be a direct or indirect reduction in food availability for the overwintering population.</p> <p><b>Non-selective extraction of Red-throated Divers</b>            Non-selective extraction can occur through entanglement in nets or through bird strike. Static nets can be considered a significant risk to the species through entanglement and reduction of food availability. Entanglement in static nets is a major cause of known mortality in Red-throated Divers.</p> <p>Impacts may also occur from collision with wind turbines if birds fly at a height above 20m. However, it has been observed that they generally fly below this height.</p>

Outer Thames Estuary SPA	
<b>Landowner/ Management Responsibility</b>	<p>Crown Estate. Activities within SPA (as noted in Departmental Brief: Outer Thames Estuary SPA November 2009) include:</p> <ul style="list-style-type: none"> <li>• Commercial fisheries (approximately 180 commercial fishing boats operate within the area, fishing for sole, cod, bass, ray, sprats, plaice, herring and eels);</li> <li>• Shellfish harvesting (the cockle industry is the largest in the UK).</li> <li>• The Port of London is one of the UK’s largest ports, with over 80 terminals handling cargo along the Thames (Port of London Authority (PLA) is the body responsible for navigation in the tidal Thames).</li> <li>• Aggregate extraction – occurs from a number of licensed areas operating under the umbrellas of the Anglian Offshore Dredging Association and the Thames Estuary Dredging Association;</li> <li>• Windfarms and associated on-shore cabling for connections to the National Grid. Scroby Sands Wind Array comprising 30 turbines off the Norfolk Coast has been operational since 2004 and the southern end of the wind farm is within the SPA area.</li> <li>• Recreation – marine activities include sailing, boat trips, bird watching, sea angling, water sports and scuba diving (majority of these activities occur within the inshore waters).</li> </ul>
<b>HRA/AA Studies undertaken that address this site</b>	<p>No specific HRA/AA studies have been found in relation to the effects of development plans or projects on the Outer Thames Estuary SPA designation, but various Environmental Impact Assessments and Strategic Environmental Assessments are also relevant:</p> <ul style="list-style-type: none"> <li>• Aggregate Application Areas – Crown Estate data (<a href="http://www.thecrownestate.co.uk/dredge_areas_statistics">www.thecrownestate.co.uk/dredge_areas_statistics</a>) indicate that the industry is investigating potential for extraction in areas located partially in the SPA. Marine aggregate extraction is a heavily regulated activity (on-going and new plans or projects)</li> <li>• Gas Storage Pipeline –A number of pipe routes have been reviewed for transporting the CO<sub>2</sub> from The Thames Cluster to the Hewett Gas Field, including an off-shore route which would pass through the SPA for approximately 143km (Capturing carbon, tackling climate change: A vision for a CCS cluster in the South East, E-ON, April 2009). No environmental supporting information was available for the above proposal; however, it is likely that vessels used to maintain, supply or construct structures in the SPA could result in potentially significant levels of disturbance on the Red-throated Divers. In addition if the gas pipe lines within the site were to leak, this could potentially cause toxic contamination of the</li> </ul>

	Outer Thames Estuary SPA
	<p>site (though this is likely to be a temporary impact).</p> <ul style="list-style-type: none"> <li>• Gunfleet Sands Wind Farm (Round 2). The proposed GS2 extension is a 64MW offshore wind farm comprising up to 22 turbines and associated inter-turbine cables off the coast at Clacton-on-Sea. An Environmental Statement for GS Round 2 was prepared in June 2007 and took into account the possible future designation of the Outer Thames SPA. Extensive surveys showed that GS2 is located in an area of relatively low bird density although species are present that are of conservation importance, including Red-throated Diver. A systematic assessment of the potential impacts on birds arising from the proposed construction, operation and decommissioning of the wind farm, alone and in-combination with other developments in the Thames Estuary has been undertaken. Potential impacts assessed included displacement from the wind farm site due to the presence of turbines, collision mortality, habitat loss and the risk of creating a `barrier` to migratory birds. Possible effects upon the potential Thames Estuary SPA were also assessed and it was predicted that GS2, either alone or in-combination with other developments or activities, will have no impact upon the SPA.</li> <li>• London Array Wind Farm. Phase 1 will consist of up to 175 turbines covering an area of approximately 100km<sup>2</sup>. Phase 2 of the London Array Project has consent but permission to construct is dependent on the results of the monitoring from Phase 1 demonstrating no significant impact on the Red-throated Diver population. The Environmental Statement for the London Array Wind Farm is not available. HRA/AA would not have been carried out as the SPA had not been identified at that time of the project being proposed. The noise from pile driving the monopiles and the noise and visual presence of vessels used for construction are likely to disturb and displace Red-throated Divers (Outer Thames SPA Draft Consultation Impact Assessment, November 2009). There is a licence condition for the development which specifies that from 1<sup>st</sup> November to 31<sup>st</sup> March all vessels involved in construction operations must approach the site from the south using main shipping channels and leave by the same route to minimise any potential disturbance to Red-throated Divers.</li> <li>• Fisheries. The impacts of the fisheries industry on the SPA is difficult to predict given the paucity of information on the likely intensity of fishing over the next ten years. The presence of vessels fishing in the site could potentially disturb and displace Red-throated Divers, particularly in the areas where there are more productive fisheries. In addition, fishing could directly reduce the abundance of fish that the designated species feed upon, both through extraction of target species and as by-catch</li> </ul>

## Ramsar Sites

### Site Name: Dengie (Mid-Essex Coast Phase 1)

- Location: 514126N/005734E
- JNCC Site Code: [UK11018](#)
- Size: 3127.23 ha
- Designation: Ramsar

Dengie (Mid-Essex Coast Phase 1) Ramsar	
<b>Site Description</b>	Dengie is a large and remote area of tidal mudflat and saltmarsh at the eastern end of the Dengie Peninsula, between the Blackwater and Crouch Estuaries. The saltmarsh is the largest continuous example of its type in Essex. Foreshore, saltmarsh and beaches support an outstanding assemblage of rare coastal flora. It hosts internationally and nationally important wintering populations of wildfowl and waders, and in summer supports a range of breeding coastal birds including rarities. The formation of cockleshell spits and beaches is of geomorphological interest.
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• Qualifies by virtue of the extent and diversity of saltmarsh habitat present. Dengie and four other sites in the Mid-Essex Coast Ramsar site complex includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• Dengie supports a number of rare plant and animal species. The Dengie has 11 species of nationally scarce plants as well as an invertebrate fauna that includes Red Data Book species.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.</li> </ul>

Dengie (Mid-Essex Coast Phase 1) Ramsar													
	<p><b>Ramsar criterion 5</b></p> <ul style="list-style-type: none"> <li>Assemblages of international importance: 43828 waterfowl (5 year peak mean 19098/99 – 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations - Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>Dark Bellied Brent Goose</li> <li>Grey Plover</li> <li>Red Knot</li> </ul> <p>Species identified subsequent to designation for possible future consideration under criterion 6</p> <ul style="list-style-type: none"> <li>Bar tailed godwit</li> </ul>												
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Dengie Ramsar covers the same area as the Dengie SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.												
<b>Component SSSIs</b>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">Ramsar Component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td>Dengie SSSI (9 units)</td> <td>62.77%</td> <td>0.00%</td> <td>0.00%</td> <td>37.23%</td> <td>0.00%</td> </tr> </tbody> </table>	Ramsar Component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Dengie SSSI (9 units)	62.77%	0.00%	0.00%	37.23%	0.00%
Ramsar Component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Dengie SSSI (9 units)	62.77%	0.00%	0.00%	37.23%	0.00%								
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	As for Dengie SPA												

<b>Dengie (Mid-Essex Coast Phase 1) Ramsar</b>	
<b>Ramsar Condition Assessment</b>	See SSSI condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>As for Dengie SPA</p> <p>The main current threat to the Ramsar site is erosion. The Essex Coast and Estuaries Coastal Habitat Management Plan (<a href="#">CHaMP</a>) covers the site and is expected to inform the shoreline management plan as well as local plan policies to help address this issue.</p>
<b>Landowner/ Management Responsibility</b>	<p>See Dengie SPA (The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes and is overseen by the relevant statutory conservation agency).</p> <p>Management plans have been produced for the Crouch and Roach Estuaries and Blackwater Estuary. The northern part of the Dengie SPA falls under the management plan for Blackwater Estuary whilst the remainder falls under the management plan for Crouch and Roach Estuary.</p> <p>The Dengie site is also designated as a National Nature Reserve. Natural England are usually responsible for management of NNRs.</p>
<b>HRA/AA Studies undertaken that address this site</b>	As for Dengie SPA

## Site Name: Colne Estuary (Mid-Essex Coast Phase 2)

- Location: 514857N/005736E
- JNCC Site Code: [UK11015](#)
- Size: 2701.43
- Designation: Ramsar

Colne Estuary (Mid-Essex Coast Phase 2) Ramsar	
<b>Site Description</b>	Colne Estuary is a comparatively short and branching estuary, with five tidal arms which flow into the main river channel. The estuary has a narrow intertidal zone predominantly composed of flats of fine silt with mudflat communities typical of south-eastern estuaries. The estuary is of international importance for wintering Brent Geese and Black-tailed Godwit and of national importance for breeding Little Terns and five other species of wintering waders and wildfowl. The variety of habitats which include mudflat, saltmarsh, grazing marsh, sand and shingle spits, disused gravel pits and reedbeds, support outstanding assemblages of invertebrates and plants.
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• The site is important due to the extent and diversity of saltmarsh present. This site, and four other sites in the Mid-Essex Coast complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain</li> </ul> <p><b>Ramsar criterion 5</b></p>

<b>Colne Estuary (Mid-Essex Coast Phase 2) Ramsar</b>													
	<ul style="list-style-type: none"> <li>Assemblages of international importance - Species with peak counts in winter: 32041 waterfowl (5 year peak mean 1998/99 – 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Species with peak counts in winter - Qualifying species/populations</p> <ul style="list-style-type: none"> <li>Dark-bellied Brent Goose</li> <li>Common Redshank</li> </ul> <p><b>Species/populations identified subsequent to designation for possible future consideration under criterion 6</b></p> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>Black-tailed Godwit</li> </ul>												
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Colne Estuary Ramsar covers the same area as the Colne Estuary SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.												
<b>Component SSSIs</b>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">Ramsar component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Colne Estuary SSSI (45 units)</td> <td>47.16%</td> <td>0.00%</td> <td>0.00%</td> <td>52.84%</td> <td>0.00%</td> </tr> </tbody> </table>	Ramsar component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Colne Estuary SSSI (45 units)	47.16%	0.00%	0.00%	52.84%	0.00%
Ramsar component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Colne Estuary SSSI (45 units)	47.16%	0.00%	0.00%	52.84%	0.00%								
<b>Key Environmental</b>	As for Colne Estuary SPA												

Colne Estuary (Mid-Essex Coast Phase 2) Ramsar	
<b>Conditions (factors that maintain site integrity)</b>	
<b>Ramsar Condition Assessment</b>	See SSSI condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>As for Colne Estuary SPA</p> <p>The main threats to the Ramsar site are erosion, and pollution from agricultural fertilisers, pesticides and agricultural runoff. The Essex Coast and Estuaries Coastal Habitat Management Plan (<a href="#">CHaMP</a>) covers the site and it is expected to inform the shoreline management plan as well as local plan policies to help address this issue. It is proposed at a strategic level to consider opportunities for managed re-alignment. The Water Framework Directive and agri-environment schemes are expected to deal with agricultural pollution issues.</p>
<b>Landowner/ Management Responsibility</b>	<p>See Colne Estuary SPA (The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes and is overseen by the relevant statutory conservation agency).</p> <p>The Colne Estuary is also designated as a National Nature Reserve. The site is managed by Natural England and Essex Wildlife Trust.</p>
<b>HRA/AA Studies undertaken that address this site</b>	As for Colne Estuary SPA

**Site Name: Crouch and Roach Estuaries (Mid-Essex Coast Phase 3)**

- **Location:** 513816N/ 004010E
- **JNCC Site Code:** [UK11058](#)
- **Size:** 1735.58
- **Designation:** Ramsar

<b>Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar</b>	
<b>Site Description</b>	<p>The Rivers Crouch and Roach are situated in South Essex. The River Crouch occupies a shallow valley between two ridges of London Clay, whilst the River Roach is set predominantly between areas of brick earth and loams with patches of sand and gravel. The intertidal zone along the Rivers Crouch and Roach is 'squeezed' between the sea walls of both banks and the river channel. This leaves a relatively narrow strip of tidal mud unlike other estuaries in the county, which, nonetheless, is used by significant numbers of birds. One species is present in internationally important numbers, and three other species of wader and wildfowl occur in nationally important numbers. Additional interest is provided by the aquatic and terrestrial invertebrates and by an outstanding assemblage of nationally scarce plants.</p>
<b>Qualifying Features</b>	<p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• Supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant and animal including 13 nationally scarce plant species. Several important invertebrate species are also present on the site.</li> </ul> <p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter – 16970 waterfowl (5 year peak mean 1998/99 – 200/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations - Species peak counts in winter:</p>

Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar													
	<ul style="list-style-type: none"> <li>• Dark-bellied Brent Goose</li> </ul>												
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Crouch and Roach Ramsar covers the same area as the Crouch and Roach SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.												
<b>Component SSSIs</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d3d3d3;">Ramsar component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Crouch and Roach Estuaries SSSI (58 units)</td> <td style="text-align: center;">23.5%</td> <td style="text-align: center;">0.0%</td> <td style="text-align: center;">0.67%</td> <td style="text-align: center;">75.83%</td> <td style="text-align: center;">0.0%</td> </tr> </tbody> </table>	Ramsar component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Crouch and Roach Estuaries SSSI (58 units)	23.5%	0.0%	0.67%	75.83%	0.0%
Ramsar component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Crouch and Roach Estuaries SSSI (58 units)	23.5%	0.0%	0.67%	75.83%	0.0%								
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	As for Crouch and Roach SPA												
<b>Ramsar Condition Assessment</b>	See SSSI condition												
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>As for Crouch and Roach SPA</p> <p>The site is at risk from erosion due to sea defences amplifying erosion in undefended areas. The Essex Coast and Estuaries Coastal Habitat Management Plan (<a href="#">CHaMP</a>) covers the site and is expected to inform the shoreline management plan as well as local policies to help address this issue. The site is also under threat from persistent drought and a lack of freshwater flowing into the site.</p>												

<b>Crouch and Roach Estuaries (Mid-Essex Coast Phase 3) Ramsar</b>	
<b>Landowner/ Management Responsibility</b>	See Crouch and Roach SPA (The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes and is overseen by the relevant statutory conservation agency).
<b>HRA/AA Studies undertaken that address this site</b>	As for Crouch and Roach SPA

**Site Name: Blackwater Estuary (Mid-Essex Coast Phase 4)**

- **Location:** 514513N/005159E
- **JNCC Site Code:** [UK11007](#)
- **Size:** 4395.15
- **Designation:** Ramsar

Blackwater Estuary (Mid-Essex Coast Phase 4)	
<b>Site Description</b>	The Blackwater Estuary is the largest estuary in Essex north of the Thames and, is one of the largest estuarine complexes in East Anglia. Its mudflats, fringed by saltmarsh on the upper shores, support internationally and nationally important numbers of overwintering waterfowl. Shingle and shell banks and offshore islands are also a feature of the tidal flats. The surrounding terrestrial habitats; the sea wall, ancient grazing marsh and its associated fleet and ditch systems, plus semi-improved grassland are also of high conservation interest. This rich mosaic of habitats supports an outstanding assemblage of nationally scarce plants and a nationally important assemblage of rare invertebrates. There are 16 British Red Data Book species and 94 notable and local species.
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• The site qualifies by virtue of the extent and diversity of saltmarsh habitat present. This site and the four others in the Mid-Essex Coast complex, includes a total of 3,237 ha that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• The invertebrate fauna is well represented and includes at least 16 British Red Data Book species.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.</li> </ul> <p><b>Ramsar criterion 5</b></p>

	<b>Blackwater Estuary (Mid-Essex Coast Phase 4)</b>
	<p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter- 105061 waterfowl (5 year peak mean 1998/99-2002/2003)</li> </ul> <p><b>Ramsar criterion 6</b></p> <p>Species/populations occurring at international levels of importance Qualifying species/populations – species with peak counts in winter</p> <ul style="list-style-type: none"> <li>• Dark-bellied Brent Goose</li> <li>• Grey Plover</li> <li>• Dunlin</li> <li>• Black-tailed Godwit</li> </ul> <p><b>Species/populations identified subsequent to designation for possible future consideration under criterion 6</b></p> <p>Species with peak counts in winter</p> <ul style="list-style-type: none"> <li>• Common Shelduck</li> <li>• European Golden Plover</li> <li>• Common Redshank</li> </ul>
<b>Conservation Objectives</b>	<p>No information currently available on conservation objectives specifically relating to the Ramsar site however the Blackwater Estuary Ramsar covers the same area as the Blackwater Estuary SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.</p>
<b>Component SSSIs</b>	

	Blackwater Estuary (Mid-Essex Coast Phase 4)					
	SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed
	Blackwater Estuary SSSI (89 units)	47.16%	0.00%	0.00%	52.84%	0.00%
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	As for Blackwater Estuary SPA					
<b>Ramsar Condition Assessment</b>	See SSSI condition					
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>As for Blackwater Estuary SPA</p> <p>The main threats to the Ramsar site are erosion, and pollution from agricultural fertilisers. The Essex Coast and Estuaries Coastal Habitat Management Plan (<a href="#">CHaMP</a>) covers the site and it is expected to inform the shoreline management plan as well as local plan policies to help address this issue. It is proposed at a strategic level to consider opportunities for managed re-alignment. The Water Framework Directive is expected to deal with water quality issues throughout the system.</p>					
<b>Landowner/ Management Responsibility</b>	<p>See Blackwater Estuary SPA (The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes and is overseen by the relevant statutory conservation agency).</p> <p>The Blackwater Estuary is also designated as a National Nature Reserve. Two areas of the reserve are managed 1) Old Hall Marshes which is managed by the RSPB and 2) Tollesbury Flats which is managed by Natural England.</p>					

	<b>Blackwater Estuary (Mid-Essex Coast Phase 4)</b>
<b>HRA/AA Studies undertaken that address this site</b>	As for Blackwater Estuary SPA

**Site Name: Foulness (Mid-Essex Coast Phase 5)**

- **Location:** 513425N/005517E
- **JNCC Site Code:** [UK11026](#)
- **Size:** 10932.95
- **Designation:** Ramsar

Foulness (Mid-Essex Coast Phase 5) Ramsar	
<b>Site Description</b>	Foulness is part of an open coast estuarine system comprising grazing marsh, saltmarsh, intertidal mudflats and sandflats which support nationally rare and nationally scarce plants, and nationally and internationally important populations of breeding, migratory and wintering waterfowl.
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• This site qualifies by virtue of the extent and diversity of saltmarsh habitat present. This and four other sites in the Mid-Essex Coast Ramsar site complex, include a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• The site supports a number of nationally-rare and nationally scarce plant species and British Red Data Book invertebrates.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site contains extensive saltmarsh habitat, with areas supporting full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.</li> </ul> <p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter: 82148 waterfowl (5 year peak mean 1998/99- 2002/2003)</li> </ul>

<b>Foulness (Mid-Essex Coast Phase 5) Ramsar</b>													
	<p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations</p> <p>Species with peak counts in spring/autumn</p> <ul style="list-style-type: none"> <li>• Common Redshank</li> <li>• Eurasian Oystercatcher</li> <li>• Grey Plover</li> <li>• Red Knot</li> <li>• Wintering</li> <li>• Bar-tailed Godwit</li> </ul>												
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Foulness Ramsar covers the same area as the Foulness SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.												
<b>Component SSSIs</b>	<table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #d3d3d3;">SPA component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td style="background-color: #d3d3d3;">Foulness SSSI (33 units)</td> <td>77.94%</td> <td>0.30%</td> <td>0.80%</td> <td>20.96%</td> <td>0.0%</td> </tr> </tbody> </table>	SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Foulness SSSI (33 units)	77.94%	0.30%	0.80%	20.96%	0.0%
SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Foulness SSSI (33 units)	77.94%	0.30%	0.80%	20.96%	0.0%								
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	See Foulness SPA												

<b>Foulness (Mid-Essex Coast Phase 5) Ramsar</b>	
<b>Ramsar Condition Assessment</b>	See SSSI Condition
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>See Foulness SPA</p> <p>The site is at risk from erosion due to sea defences amplifying erosion in undefended areas. The Essex Coast and Estuaries Coastal Habitat Management Plan (<a href="#">CHaMP</a>) covers the site and is expected to inform the shoreline management plan as well as local policies to help address this issue.</p>
<b>Landowner/ Management Responsibility</b>	<p>See Foulness SPA (The management of Ramsar sites in the UK is determined by either a formal management plan or through other management planning processes and is overseen by the relevant statutory conservation agency).</p> <p>A management plan has been produced for the Crouch and Roach Estuaries, Foulness Ramsar site falls within the remit of this plan.</p>
<b>HRA/AA Studies undertaken that address this site</b>	As for Foulness SPA

**Site Name: Abberton Reservoir**

- **Location:** 514937N/005222E
- **JNCC Site Code:** [UK11001](#)
- **Size:** 726.2
- **Designation:** Ramsar

<b>Abberton Reservoir Ramsar</b>	
<b>Site Description</b>	Abberton Reservoir is a large storage reservoir built in a long shallow valley. It is the largest freshwater body in Essex and is one of the most important reservoirs in Britain for wildfowl. It is less than 8 km from the coast and its primary role is as a roost for the local estuarine wildfowl population.
<b>Qualifying Features</b>	<p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter: 23787 waterfowl (5 year peak mean 1998/99- 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations</p> <p>Species with peak counts in spring/autumn</p> <ul style="list-style-type: none"> <li>• Gadwall</li> <li>• Northern Shoveler</li> </ul> <p>Species with peak counts in winter</p> <ul style="list-style-type: none"> <li>• Eurasian Wigeon</li> </ul> <p><b>Species/populations identified subsequent to designation for possible further consideration under Ramsar criterion 6</b></p> <p>Species with peak counts in spring/autumn</p>

Abberton Reservoir Ramsar													
	<ul style="list-style-type: none"> <li>• Mute Swan</li> <li>• Common Pochard</li> </ul>												
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Abberton Reservoir Ramsar covers the same area as the Abberton Reservoir SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.												
<b>Component SSSIs</b>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #d3d3d3;">SPA component SSSI's</th> <th style="background-color: #d3d3d3;">Favourable</th> <th style="background-color: #d3d3d3;">Unfavourable recovering</th> <th style="background-color: #d3d3d3;">Unfavourable no change</th> <th style="background-color: #d3d3d3;">Unfavourable declining</th> <th style="background-color: #d3d3d3;">Destroyed, part destroyed</th> </tr> </thead> <tbody> <tr> <td>Abberton Reservoir SSSI (3 units)</td> <td style="text-align: center;">100.00%</td> <td style="text-align: center;">0.00%</td> <td style="text-align: center;">0.00%</td> <td style="text-align: center;">0.00%</td> <td style="text-align: center;">0.00%</td> </tr> </tbody> </table>	SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed	Abberton Reservoir SSSI (3 units)	100.00%	0.00%	0.00%	0.00%	0.00%
SPA component SSSI's	Favourable	Unfavourable recovering	Unfavourable no change	Unfavourable declining	Destroyed, part destroyed								
Abberton Reservoir SSSI (3 units)	100.00%	0.00%	0.00%	0.00%	0.00%								
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	See Abberton Reservoir SPA												
<b>Ramsar Condition Assessment</b>	See SSSI Condition												
<b>Vulnerabilities (includes existing pressures and trends)</b>	See Abberton Reservoir SPA												
<b>Landowner/ Management Responsibility</b>	Essex and Suffolk Water own the reservoir and have a consultative committee which addresses conservation issues at all its sites. The Abberton Reserve Committee (involving Essex Wildlife Trust and Natural England) addresses local issues.												
<b>HRA/AA Studies undertaken that address this site</b>	As for Abberton SPA												

## Appendix 2: Plans and Programmes Review

### Regional

Plan	Potential impacts that could cause 'in-combination' effects
<p><b>Essex County Council Minerals and Waste Development Framework (under review)</b></p>	<p>HRA<sup>8</sup> screening has been undertaken for the Minerals Development Documents. This concluded that further assessment of impacts on Natura 2000 sites and Ramsar sites will need to be carried out when preferred options for the sites have been identified.</p> <p>The main impacts of mineral extraction which could cause in-combination effects on Natura 2000 and Ramsar sites identified within the AA are:</p> <ul style="list-style-type: none"> <li>• Habitat loss/fragmentation</li> <li>• Emissions (particularly dust) both through minerals extraction and aggregate recycling</li> <li>• Impacts on water flows which can be far reaching including disturbance to groundwater flow, changes to run off patterns, water table or groundwater sites</li> <li>• Human disturbance, for example through increased noise, vibration and light and vehicular use</li> <li>• Some minerals development may compliment current conservation practice where restoration and after use incorporate a biodiversity component through extending habitat</li> </ul> <p>The Waste Development documents are in their early stages. Depending on site allocations and policy there could be in combination effects from the Waste Development document.</p>
<p><b>Essex County Council Local Transport Plan 2006-2011</b></p>	<p>Potential impacts include:</p> <ul style="list-style-type: none"> <li>• increased transport movements;</li> <li>• dust/noise/odour associated with transport;</li> </ul>

<sup>8</sup> Eunomia Research and Consulting 2009. Minerals Development Documents: Issues and Options: Appropriate Assessment Screening Report Essex County Council.

Plan	Potential impacts that could cause 'in-combination' effects
	<ul style="list-style-type: none"> <li>• landtake</li> <li>• impacts on surface water run-off; construction such as laying pipes/cables</li> <li>• Loss of or deterioration of designated sites</li> <li>• Significant pollution released into groundwater</li> <li>• Increase in air pollution</li> </ul> <p>The plan also includes policies for improving air quality and sustainable transport which would have beneficial impacts.</p>
<p><b>The Combined Essex Catchment Abstraction Management Strategy (February 2007), Environment Agency</b></p>	<p>Under the habitat regulations the Environment Agency have to assess the affects of existing abstraction licences and any new applications to make sure they are not impacting on internationally important nature conservation sites such as Natura 2000 sites and Ramsar sites.</p> <p>If an assessment shows that a new application could have an impact on an SAC/SPA the EA follow strict rules in setting a time limit for that licence. These are:</p> <ul style="list-style-type: none"> <li>• If it cannot be determined that your application will not affect the site EA have to either put conditions on the licence so that it cannot affect the site or refuse the application;</li> <li>• EA may be able to grant the licence but only with a short time limit so we can be confident it is not having an effect on the site;</li> <li>• In some instances it may be possible to issue the licence with additional conditions. This may include monitoring the impact of licence and altering the licence if necessary;</li> <li>• The Environment Agency has a statutory duty, to ensure that the integrity of the internationally designated sites are maintained or restored through sustainable water resources management. As part of this duty, they have to ensure that permissions (abstraction licences, discharge consents, radioactive substance authorisations, waste management licences and integrated pollution control (IPC) authorisations) do not have an adverse effect on the integrity of the designated sites.</li> <li>• The catchment has been split into North and South Essex and then further into 'Water Resource Management Units (WRMU). Within the North Essex catchment WRM1, WRM2 and WRM3 are most</li> </ul>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>relevant. Rivers within WRM1 are over-abstracted, over-licenced or have no water available for abstraction. Rivers within WRM2 have no water available or are over-licenced and within WRM3 they are all over-licenced.</p> <ul style="list-style-type: none"> <li>• Within the South Essex catchment WRMU 2, 3 and 4 are most relevant; water is available for these units.</li> <li>• The impact of any water shortage in the assessment areas could be felt within the Essex Estuaries SAC and the Mid-Essex Coast SPA/Ramsar complex.</li> </ul>
<p><b>River Basin Management Plan, Anglian River Basin District (Environment Agency December 2009)</b></p>	<p>The Environment Agency, together with the Anglian liaison panel, has produced a River Basin Management Plan for the Anglian River Basin District. The plan describes what everyone has to do to improve the water environment over the next 20 years.</p> <p>Aims of the Plan:</p> <ul style="list-style-type: none"> <li>• Improving rural land management</li> <li>• Reducing the impact of transport and built environments</li> <li>• Addressing point sources of pollution</li> <li>• Securing sustainable amounts of water</li> <li>• Improving wildlife habitats</li> </ul> <p>Plan states that the EA aims to modify or revoke all abstraction licences affecting the conservation features of Natura 2000 sites by 2015 and overall effects would therefore be expected to be positive.</p>
<p><b>Renewable Energy Strategy for Essex, Essex County Council</b></p>	<p>This strategy raises awareness of renewable opportunities in Essex. Of most relevance to the Natura 2000 and Ramsar sites of the Essex Estuaries are offshore and onshore windfarms. This could result in 'in combination' effects. Opportunities for windfarms are supported however the strategy states that these need to avoid ecologically sensitive sites.</p>
<p><b>Essex Estuaries Coastal Habitat Management Plan (CHaMP) October 2002</b></p>	<p>The primary functions of the Essex Estuaries CHaMP is:</p> <ul style="list-style-type: none"> <li>• To offer a long-term strategic view on the balance of losses and gains to habitats and species of</li> </ul>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>European interest likely to result from sea level rise, and the flood and coastal defence response to it;</p> <ul style="list-style-type: none"> <li>• To develop a response to these losses and gains by informing the strategic direction for the conservation measures that are necessary to offset predicted losses;</li> <li>• Identify suitable areas for new habitats that will need to be created; and</li> <li>• Make recommendations to Shoreline Management Plans to ensure flood and coastal defence options address the requirements of the Habitats and Birds Directives.</li> </ul> <p>The overall conclusion of the CHaMP is that if existing flood defences within the estuaries were to be maintained significant areas of saltmarsh would be lost by 2050. The loss of salt marsh from the estuaries would represent an adverse impact upon the ecological interests of the entire Essex Estuaries cSAC and the SPAs present within the CHaMP area as a major component of the ecological diversity would be lost. This loss would have a number of ecological implications with respect to the designated features of the Essex Estuaries cSAC and the SPA/Ramsar sites:</p> <ul style="list-style-type: none"> <li>• Direct loss of salt marsh habitat, vegetation communities and associated fauna;</li> <li>• Loss of habitat used by breeding birds (e.g. avocet, redshank);</li> <li>• Reduction in estuarine roosting sites for wintering waterfowl; and,</li> <li>• Loss of a significant source of nutrient input to intertidal mudflats.</li> </ul> <p>The CHaMP considers the management of the estuaries from an ecological perspective and proposes four potential options to offset the predicted loss of saltmarsh habitat:</p> <ul style="list-style-type: none"> <li>• Holistic Restoration – restoration of reclaimed marshland along the entire length of an estuary in order to accommodate the morphological changes associated with sea level rise.</li> <li>• Progressive restoration – sequential restoration of reclaimed marshlands over a period of years beginning in the outer estuary and progressing landward.</li> <li>• Opportunistic restoration – restoration of reclaimed marshland as and where sites become available</li> <li>• Compensatory restoration – assumes maintenance of estuarine flood defences in line with associated loss of marshland due to coastal squeeze and would involve the restoration of open coast or outer estuary reclaimed marshlands in order to provide compensatory habitat.</li> </ul>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>Although designated sites are a priority consideration options for coastal habitat management could still lead to 'in-combination effects'.</p>
<p><b>Crouch and Roach Flood Management Strategy<sup>9</sup> and Blackwater and Colne Flood Management Strategy<sup>10</sup></b></p>	<p>The Government encourages operating bodies such as the Environment Agency to consider flood management in an integrated and sustainable way by looking at the whole of each estuary rather than individual sections. A long term plan, known as a flood management strategy has been developed for each estuary which sets out the policy and objectives for flood defence taking into account a broad range of issues. This aids decision making about providing the most appropriate flood management schemes and the approach allows the management of the whole flood defence system more effectively. The aims and objectives of the strategies are as follows:</p> <ul style="list-style-type: none"> <li>• Provide a flood management strategy that supports the long-term objectives of providing effective flood management schemes for the protection of people's lives and property, whilst developing towards a more sustainable estuary shape</li> <li>• Enhance salt marsh generation;</li> <li>• Avoid pollution of controlled water from release of landfill material or other sources of contamination;</li> <li>• Ensure compliance with the Conservation Regulations;</li> <li>• Maintain or enhance environmentally designated sites, habitats and species;</li> <li>• Maintain access to the sea for all vessels.</li> </ul> <p>The secondary strategic objectives of the study are to:</p> <ul style="list-style-type: none"> <li>• Maintain the extent and distribution of habitats that support the fish and shellfish populations;</li> <li>• Where necessary, re-route and create Public Rights of Way;</li> <li>• Enhance or protect socio-economic assets, significant visitor attractions and recreational resources;</li> <li>• Protect scheduled monuments and listed buildings ; and</li> <li>• Maintain or enhance the existing landscape.</li> </ul>

<sup>9</sup> [http://www.essex-estuaries.co.uk/roach\\_crouch/default.htm](http://www.essex-estuaries.co.uk/roach_crouch/default.htm)

<sup>10</sup> [http://www.essex-estuaries.co.uk/blackwater\\_colne/default.htm](http://www.essex-estuaries.co.uk/blackwater_colne/default.htm)

Plan	Potential impacts that could cause 'in-combination' effects
	<p>Whilst environmental considerations are a priority, options for flood defence could still have impacts on designated sites and therefore there may be 'in-combination' effects.</p>
<p><b>East Anglian Strategies – Shoreline Management Plans (in preparation)</b></p>	<p>A Shoreline Management Plan (SMP) provides a large-scale assessment of the risks associated with coastal evolution and presents a policy framework to address these risks to people and the developed, historic and natural environment in a sustainable manner</p> <p>The relevant Shoreline Management Plan (Harwich to Canvey Island) is currently in preparation with publication expected in 2010. Whilst it is expected that environmental designations will be a priority there is still the potential for 'in-combination' effects, however this can only be determined once the SMP is published.</p>
<p><b>North Essex Catchment Flood Management Plan (Draft) 2006</b></p>	<p>High level strategic plan that will look to assess how flood risks might change and be managed over the next 50 – 100 years. The plan considers flooding associated with rivers (tidal flood risks are to be dealt with under Shoreline Management Plans).</p> <p>Relevant catchment objectives are as follows:</p> <ul style="list-style-type: none"> <li>• To seek to manage flood risk to houses and commercial property to as low a level as possible.</li> <li>• To protect and, where possible, enhance nature conservation sites of international importance and biodiversity receptors, and promote conservation to meet the Biodiversity Action Plan (BAP) and Sites of Special Scientific Interest (SSSI) targets.</li> <li>• To protect and, where possible, improve fisheries and the value of the catchments as recreational resources.</li> <li>• To maintain compliance with water quality objectives and standards.</li> <li>• To protect and improve sustainable water abstraction and transfer schemes.</li> <li>• To maintain and increase connectivity of rivers and flood plains and improve in-stream features.</li> <li>• To achieve a sustainable approach to land use.</li> </ul>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>The following objectives are identified for the area that covers Bradwell</p> <ul style="list-style-type: none"> <li>• Upgrade defences where necessary</li> <li>• Create wetlands if feasible</li> <li>• Promote use of SuDs</li> </ul> <p>Whilst environmental considerations are a priority, options for managing flood risk could still have impacts on designated sites and therefore there may be 'in-combination' effects.</p>
<p><b>South Essex Flood Catchment Management Plan (Summary of Draft Plan) 2007.</b></p>	<p>High level strategic plan that will look to assess how flood risks might change and be managed over the next 50 – 100 years. The plan considers flooding associated with rivers (tidal flood risks are to be dealt with under Shoreline Management Plans).</p> <p>Relevant catchment objectives are as follows:</p> <ul style="list-style-type: none"> <li>• to manage flood risk to the built environment</li> <li>• to manage flood risk to the rural environment</li> <li>• to reduce vulnerability to the effects of climate change</li> <li>• to protect and improve the features and designated areas of nature conservation interest</li> <li>• to maintain and improve water quality standards, where possible</li> <li>• to protect and improve recreation and amenity facilities, where possible</li> <li>• to provide opportunities for people to come into contact with, and appreciate, wildlife and wild places</li> <li>• to protect and improve water resources, allowing for higher demand from increased urbanisation</li> </ul> <p>Whilst environmental considerations are a priority, options for managing flood risk could still have impacts on designated sites and therefore there may be 'in-combination' effects.</p>
<p><b>Review of Consents</b></p>	<p>Under the Habitat Regulations, competent authorities must review all authorisations, consents, licences and permissions with respect to their effects on Natura 2000 sites. This is known as the Review of Consents (RoC). New permissions and renewals cannot be issued unless it can be ascertained that they will not adversely affect the integrity of a designated site. The Review of Consents programme will have an overall beneficial impact on Natura 2000 sites.</p>

Plan	Potential impacts that could cause 'in-combination' effects

## Local

Plan	Potential impacts that could cause 'in-combination' effects
<p><b>Maldon District Core Strategy and Options 2007 (under consultation)</b></p>	<p>Appropriate assessment screening<sup>11</sup> of the document highlighted the following as being likely to give rise to likely significant effects and recommends that they are taken forward to stage 2 of Appropriate Assessment.</p> <p><u>Option 5b/16a. Urban regeneration of the Causeway area of Maldon/Heybridge</u></p> <ul style="list-style-type: none"> <li>• The Causeway area occupies land adjacent to Blackwater Estuary SPA/Ramsar and Essex Estuaries SAC. Development may require regeneration of flood defences which can lead to coastal squeeze.</li> </ul> <p><u>Option 5f/Issue 29: Development along the Crouch Valley Branch line</u></p> <ul style="list-style-type: none"> <li>• The Crouch Valley Branch Line runs to the immediate north of the Crouch and Roach Estuary. The railway skirts the coast for a distance of approximately 15km. Development along this route corridor could lead to significant effects on the designated sites due to increased disturbance over a considerable area.</li> </ul> <p><u>Option 15a: Protect urban areas from the effects of climate change by flood defences</u></p> <ul style="list-style-type: none"> <li>• Man made defences can lead to coastal squeeze. If the option is pursued there could be loss of saltmarsh and mudflat habitats.</li> </ul> <p><u>Option 27a: Encourage marina proposals</u></p> <ul style="list-style-type: none"> <li>• There is the suggestion that there could be an extension to the existing marina facilities in the Blackwater and Crouch estuaries. Further marina proposals could lead to disruption to sediment transport mechanisms which could affect the designated sites. In addition this could lead to increased</li> </ul>

<sup>11</sup> ARUP2007. Maldon District Core Strategy Issues and Options, Information for Appropriate Assessment Screening (Draft)

Plan	Potential impacts that could cause 'in-combination' effects
	<p>recreational activity.</p> <p><u>Option 48b: Provide additional footpaths, cycleways, bridleways and other recreational facilities in the countryside</u></p> <ul style="list-style-type: none"> <li>• Disturbance to waterfowl is likely to be caused by recreational use.</li> </ul> <p><u>2<sup>nd</sup> Report Environment Issue 2: Development of offshore windfarms, wave and tidal energy and a nuclear power station.</u></p> <ul style="list-style-type: none"> <li>• Renewable energy schemes could potentially impact on qualifying species and habitats of designated sites. Development of new nuclear power station at Bradwell is also mentioned as having the potential to have likely significant effects.</li> </ul> <p>Any of the above policies could therefore cause 'in-combination' effects.</p>
<p><b>Chelmsford Borough Council. Core Strategy and Development Control Document Adopted (February 2008)</b></p>	<p>Appropriate Assessment<sup>12</sup> of the document in 2006 identified a number of policies with the potential for significant effects:</p> <p><u>DC3: Managing development density in different locations</u></p> <ul style="list-style-type: none"> <li>• The area of concern for this policy is the high density housing levels proposed for South Woodham Ferrers town centre due to its proximity to the Crouch and Roach estuaries SPA/Ramsar site and the Essex estuaries SAC. High density housing could result in increased recreational pressure in this area.</li> </ul> <p><u>DC54: Promotion of employment clusters</u></p> <ul style="list-style-type: none"> <li>• Ferrers road industrial area, South Woodham Ferrers is within close proximity to the Essex Estuaries SAC and the Crouch and Roach Estuaries SPA/Ramsar and could have adverse impacts.</li> </ul>

<sup>12</sup> Entec Ltd 2007. Appropriate Assessment of the Chelmsford Core Strategy and Development Control Policies Submission Document DPD.

Plan	Potential impacts that could cause 'in-combination' effects
	<p><u>DC55: Location of business development</u></p> <ul style="list-style-type: none"> <li>Ferrers road industrial area, South Woodham Ferrers is within close proximity to the Essex Estuaries SAC and the Crouch and Roach Estuaries SPA/Ramsar and could have adverse impacts.</li> </ul> <p><u>DC56: Industrial and warehouse development</u></p> <ul style="list-style-type: none"> <li>Ferrers road industrial area, South Woodham Ferrers is within close proximity to the Essex Estuaries SAC and the Crouch and Roach Estuaries SPA/Ramsar and could have adverse impacts</li> <li>Furthermore rural proposals for industrial/warehouse development include a location at Mayphil Industrial Estate, Battlesbridge. This area is also in close proximity and upstream of the Essex Estuaries SAC and Crouch and Roach SPA/Ramsar site.</li> </ul> <p>Any of the above policies could cause 'in-combination' effects. Recommendations in the AA were made for re-wording of policies. The adopted document includes Policy CP9: Protecting areas of natural and built heritage and archaeological importance</p> <p><i>'The Borough council is committed to protecting and enhancing the boroughs important natural and historic environment. The Borough council will therefore seek to sustain biodiversity, historic landscape character, archaeological and geological conservation by ensuring sites of international, national, regional and local importance are protected and enhanced.'</i></p>
<p><b>Thurrock LDF Core Strategy (adoption date proposed October 2009)</b></p>	<p>Appropriate Assessment of the Strategy was undertaken in 2007<sup>13</sup>. The following impacts were highlighted within the AA to have potential effects on the Essex Estuaries Natura 200 and Ramsar sites</p> <ul style="list-style-type: none"> <li>All of the estuaries are extensively used for recreational activity by a wide ranging catchment that includes the whole of Essex and draws in visitors from further afield. It is therefore possible that the increased populations associated with 13,830 new dwellings within the authority could contribute to an increase in recreational disturbance</li> </ul>

<sup>13</sup> Scott Wilson 2007. Habitats Regulations Assessment Final Report Prepared for Thurrock Council.

Plan	Potential impacts that could cause 'in-combination' effects
	<ul style="list-style-type: none"> <li>• Reduced water quality due to increased volumes of treated sewage effluent as a result of more households</li> <li>• Reduction in volume of freshwater inputs into the SPA as a function of increased abstraction.</li> </ul>
<p><b>Rochford District Council. Local Development Framework. Core Strategy Preferred Options (October 2008)</b></p>	<p>Whilst policies provide protection from development in the coastal zone, extensions to residential areas and employment areas in the district could mean increased recreational use of the area.</p>
<p><b>Colchester Borough Core Strategy 2008</b></p>	<p>An appropriate assessment of the plan<sup>14</sup> identified the following as having a potential impact on Abberton Reservoir SPA/Ramsar, Blackwater Estuary SPA/Ramsar, Colne Estuary SPA/Ramsar and Essex Estuaries SAC.</p> <p>The following potential impacts were identified:</p> <ul style="list-style-type: none"> <li>• Population expansion has the potential to increase nutrient loading to the international sites, with the potential for impacts on site integrity through eutrophication.</li> <li>• An increase in population and household numbers in the borough will place demands on water resources in the region. This has the potential to reduce the flow in small freshwater streams which flow across mudflats in conditions of low tide and which are known to be of high importance to estuarine birds.</li> <li>• The increased number of visitors to international sites due to increases in housing or tourism facilities near to these sites will likely result in non-physical and physical disturbance.</li> <li>• Where housing is situated directly adjacent to an international site, the activity of residents and visitors has the potential to result in localised perpetual non-physical and physical disturbance.</li> </ul>

<sup>14</sup> Colchester Core Strategy Sustainability Appraisal [http://www.colchester.gov.uk/servedoc.asp?filename=Core\\_Strategy\\_Sustainability\\_statement.pdf](http://www.colchester.gov.uk/servedoc.asp?filename=Core_Strategy_Sustainability_statement.pdf)

Plan	Potential impacts that could cause 'in-combination' effects
<b>Tendring District Council Local Development Framework.</b>	The Local Development Framework is currently in preparation and adoption of the plan is expected in August/September 2010. It is possible that 'in-combination' effects may arise from (increased housing, waste effluent, industry and recreation etc) however as documents are not yet available it is not possible at this stage to fully determine the possible 'in-combination' effects on Natura 2000 sites.

## Other plans and programmes

Plan	Potential impacts that could cause 'in-combination' effects
<b>Decommissioning of Bradwell Reactor Site</b>	<p>An existing nuclear reactor at Bradwell is currently being de-commissioned. Potential cumulative impacts include:</p> <ul style="list-style-type: none"> <li>• Possible impacts through demolition of buildings and foundations, construction work and other general activity on site</li> <li>• Impacts from demolition noise and emissions</li> <li>• Increased traffic flows</li> <li>• Turbid water entering surface water and drainage ditches</li> <li>• Risks of spills entering the surface water system</li> <li>• Groundwater contamination/change in ground water levels</li> <li>• Risk of contaminated demolition waste</li> </ul> <p>Prevention of impacts is being dealt with through an Environmental Management plan<sup>15</sup> for the site.</p>
<b>Bradwell Windfarm proposal (under appeal)</b>	Possible cumulative impacts from noise during construction and possible short term and localised water quality effects due to water table level and turbine excavations.

<sup>15</sup> Magnox South (March 2009) Bradwell Reactor Site Environmental Management Plan 2008/2009, ES/EMP/003 – Issue 1.

Plan	Potential impacts that could cause 'in-combination' effects
<b>Raising of Abberton Reservoir</b>	The raising of Abberton Reservoir is proposed to cover an existing and predicted shortfall in water supply in the Essex supply area. Raising is expected to occur from 3.2m to 21m. The raising of the reservoir is expected to have an overall significant positive effect on the conservation status of the migratory and wintering waterfowl assemblage by providing substantial wetland habitat in comparison to the existing reservoir and therefore providing additional feeding sources and roosting areas.
<b>Eco-Towns Programme – North East Elsenham</b>	An appropriate assessment <sup>16</sup> of the eco-towns programme at North East Elsenham concluded that it was not possible to say with confidence that development at North East Elsenham would not lead to adverse effects on European Sites (particularly the Colne Estuary) as a result of increased abstraction, when considered in combination with other plans and projects.
<b>Plans/Programmes relating to the Outer Thames Estuary SPA</b>	<p>'In-combination' effects are unknown at the current time, as no other plans or programmes were noted that address this site. In combination impacts from the following current and proposed economic activities in the Outer Thames Estuary could, however, arise:<sup>17</sup></p> <p><b>Aggregate extraction</b>                      The Anglian Offshore (East Coast) region and the Thames region, within which the SPA lies, are both strategically important areas for this industry. Despite a decrease in extraction levels from the East Coast region there remain large quantities of primary aggregate indicating that ongoing extraction is likely over the next ten years. The Thames region is increasing steadily since production from newly discovered large resources started in 2005. Depending on local demand and depletion of land-won aggregates, intensity may increase in the next ten years.</p>

<sup>16</sup> Scott Wilson for Communities and Local Government, 2008. Eco-towns: Sustainability Appraisal and Habitats Regulations Assessment of the Eco-towns programme, North East Elsenham.

<sup>17</sup> The majority of information for the Outer Thames pSPA has been obtained from Natural England consultation documents found at the following location:  
<http://www.naturalengland.org.uk/ourwork/marine/sacconsultation/default.aspx>

Plan	Potential impacts that could cause 'in-combination' effects
	<p><b>Oil and Gas</b></p> <p>It has been proposed to construct a gas interconnector between the UK and the Netherlands to import gas from Europe, which would run across the North Sea and into the Thames Estuary across the southern part of the SPA. The pipeline has not yet been consented. In addition, a gas storage pipeline has been proposed that would connect the Kingsnorth Power Station (located to the south of the SPA) to the Hewett gas field (to the north of the SPA). Of the proposed preliminary route, 143km would pass through the SPA. This has not yet been consented.</p> <p>In the long term, routes for transport of CO<sub>2</sub> to strategic carbon storage capacity could pass through the site making a significant contribution to achievement of UK carbon reduction targets. It is estimated that 190km of new pipeline to transport CO<sub>2</sub> could be installed in the SPA in the next 10 years.</p> <p><b>Renewables</b></p> <p>Two operating wind farms (Kentish Flats and Scroby Sands) are fully and partially located within the site respectively.</p> <p>The Gunfleet Sands wind farm (which is located fully within the site) consists of a Round 1 project and a Round 2 project and is currently under construction off the Essex Coast at Clacton-on-Sea. Potential impacts on Red-throated Divers associated with the Outer Thames SPA were assessed as part of the Environmental Statement and included displacement from the wind farm site due to the presence of turbines, collision mortality, habitat loss and the risk of creating a 'barrier'. It was predicted that GS2, either alone or in-combination with other developments or activities, will have no impact upon the SPA.</p> <p>Construction on Phase 1 of the London Array wind farm project is likely to start in spring 2011. Phase 2 of the London Array project has consent, but permission to construct is dependent on the results of monitoring from Phase 1 demonstrating no significant impact on the Red-throated Diver population. London Array Phases 1 and 2 are both fully within the SPA. The noise from pile driving the monopiles and the noise and visual presence of vessels used for construction are likely to disturb and displace Red-throated Divers associated with the Outer Thames Estuary SPA (Outer Thames SPA Draft Consultation Impact Assessment, November 2009). There is a licence condition for the development which specifies that from 1</p>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>November to 31 March all vessels involved in construction operations must approach the site from the south using main shipping channels and leave by the same route to minimise any potential disturbance to Red-throated Divers.</p> <p>In terms of other future development, the Crown Estate has issued an Invitation to Tender to developers for the Round 3 offshore wind farm leasing programme for the delivery of up to 25 Giga Watt (GW) in capacity of potential new offshore wind farm sites by 2020. Round 3 overlaps with 7.8% of the total area of the SPA.</p> <p><b>Cables</b> A number of operational telecommunication cables pass through the site amounting to a total length of 225km. Most planned cable laying activity is replacement or upgrading of existing cables.</p> <p><b>Fisheries</b> The Thames Estuary supports important commercial fisheries, as well as estuarine and marine recreational angling. Approximately 180 commercial fishing boats operate within the area of the estuary. Fishing intensity may change over the next ten years. However, it is not clear what impacts may arise as a result.</p> <p><b>Shipping (including dredging of channels)</b> The Port of London is one of the UK's largest ports and the Port of London Authority (PLA) is the body responsible for ensuring safe navigation in the tidal Thames. Part of the PLA's operations is to ensure that shipping channels and berths are maintained or, in some limited cases, created. This requires occasional maintenance dredging of existing channels that have suffered from siltation or capital dredging where a new channel or berth is required.</p> <p>The port of Felixstowe is the UK's largest container port and is capable of handling the world's largest container ships. It is currently undergoing considerable expansion. In addition, new port capacity at Great Yarmouth is currently under construction and is expected to accommodate container traffic in various forms.</p> <p><b>Recreation</b> There is a high level of use of the SPA by all forms of recreational vessels. The majority of these activities</p>

Plan	Potential impacts that could cause 'in-combination' effects
	<p>are restricted to inshore waters of the estuaries and coast, although there are a large number of yacht clubs within the SPA, which use waters further offshore.</p> <p><b>Land based sources of pollution</b>                      Toxic and non-toxic pollutants enter the Thames Estuary and adjacent coastal waters from direct point source discharges of effluents or diffuse sources, such as agricultural run-off via rivers. These are both continuous and intermittent in nature, but are mostly highly diluted. Point source discharges are currently controlled through licensing by the Environment Agency.</p>

## Appendix 3: Likely Significant Effect (LSE) Screening Table

### SIGNIFICANT EFFECTS SCREENING (INCORPORATING IN-COMBINATION ASSESSMENT)

#### European Sites within a 20km radius of the nominated site

	Designation	Distance to nominated site
Essex Estuaries	<b>SAC</b>	Adjacent / within
Mid-Essex Coast Complex	<b>SPA</b>	Adjacent / within
Mid-Essex Coast Complex	<b>Ramsar</b>	Adjacent / within
Dengie (Mid-Essex Coast Phase 1)	<b>SPA</b>	Adjacent / within
Dengie (Mid-Essex Coast Phase 1)	<b>Ramsar</b>	Adjacent / within
Colne Estuary (Mid-Essex Coast Phase 2)	<b>SPA</b>	3.3 km
Colne Estuary (Mid-Essex Coast Phase 2)	<b>Ramsar</b>	3.3 km
Crouch and Roach Estuaries(Mid –Essex Coast Phase 3)	<b>SPA</b>	11.9 km
Crouch and Roach Estuaries (Mid-Essex Coast Phase 4)	<b>Ramsar</b>	11.9 km
Blackwater Estuary (Mid-Essex Coast Phase 4)	<b>SPA</b>	Adjacent / within
Blackwater Estuary (Mid-Essex Coast Phase 5)	<b>Ramsar</b>	Adjacent / within
Foulness (Mid-Essex Coast Phase 5)	<b>SPA</b>	11.5 km
Foulness (Mid-Essex Coast Phase 5)	<b>Ramsar</b>	11.5 km
Abberton Reservoir	<b>SPA</b>	8.0 km
Abberton Reservoir	<b>Ramsar</b>	8.0 km
Outer Thames Estuary	<b>SPA</b>	Adjacent / within

## Essex Estuaries SAC

**Disturbance (noise, light and visual) is not included below as habitats of the SAC are not vulnerable to the effects of noise, light or visual disturbance.**

**Authorities:** Essex County Council, Tendring District Council, Maldon District Council, Rochford District Council, Southend Borough Council, Chelmsford Borough Council, Colchester Borough Council

### Source: Construction (duration approx 5 years)

Essex Estuaries SAC: Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There may be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example dredging/tunneling/burying could impact on water quality.</p>
<b>Potential effects on the SAC: Receptor</b>	<p>Changes in organic and nutrient loading can change the species composition of plants on the saltmarsh and can affect communities on intertidal mudflats for example. Eelgrass beds.</p> <p>Changes in sediment regimes can lead to increased turbidity/smothering of coastal/intertidal habitats and their associated species to their detriment. For example reduction of light available for photosynthesis.</p> <p>Contamination by synthetic and non-synthetic compounds is potentially an issue for the estuary mudflats, sandflats and the saltmarshes.</p>

Essex Estuaries SAC: Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The maintenance of water quality and the existing sedimentary regime is noted as a key environmental condition requirement at this site.</p> <p>Given the proximity of the nominated site to the SAC, there is the potential for significant effects, particularly at a local level.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b> Short term noise and water quality effects</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p>

Essex Estuaries SAC: Construction (duration approx 5 years)	
Water Resources/Quality	
	<p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Essex Estuaries SAC: Construction (duration approx 5 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates.
<b>Potential effects on the SAC: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading, which could impact upon the estuarine plant communities and habitats.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not an identified vulnerability for the SAC, although given the proximity of the designated sites the effects of nutrient loading from air borne pollutants should be investigated further.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further environmental condition information required to eliminate aerial emissions as significant at this site.

<b>Essex Estuaries SAC: Construction (duration approx 5 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	<p>Potential impacts from: construction for example cooling water culverts, marine landing facility and infrastructure.</p> <p>Upgraded coastal protection                      Extension of site into 'buffer' habitats, and development at the coastal fringes                      Other pathways to possible significant habitat loss during construction are detailed within the water quality/resources and coastal squeeze sections</p>
<b>Potential effects on the SAC: Receptor</b>	<p>Construction activities have the potential to result in direct loss and fragmentation of key SAC habitats for example. inter-tidal and saltmarsh habitats.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Habitats in the Essex Estuaries SAC are vulnerable to physical loss including direct loss of habitat, reduction in extent, and changes to hydrology and sediment transport regimes arising from construction on the coastal fringe. Any direct loss of habitat as a result of construction works is considered to be significant.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b>                      Water quality, habitat loss, emissions, noise.</p> <p><b>Local transport plan</b>                      Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b>                      Coastal squeeze, disturbance, recreation, water quality, land take.</p> <p><b>Chelmsford Core Strategy</b>                      Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b></p>

Essex Estuaries SAC: Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Promotion of onshore and offshore windfarms  <b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats.
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Essex Estuaries SAC: Construction (duration approx 5 years)</b>	
<b>Coastal Squeeze</b>	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station for example cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SAC: Receptor</b>	<p>Loss of habitat for example through direct physical loss and changes to sedimentation regimes.</p> <p>Encroachment into the coastal fringe may result in a direct loss of habitats and environmental conditions necessary to maintain in habitats in favourable condition.</p> <p>Given the dynamic nature of estuarine systems knock on effects could also occur and habitats elsewhere in the SAC could also be affected.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The SAC habitats are highly sensitive to physical loss as a result of coastal squeeze as much of coastline is already constrained by sea walls and unable to adjust to change.</p> <p>Development associated with the nominated site along the coastal fringe could add to this problem and therefore there is a risk of LSE.</p> <p>Further understanding of the coastal processes in the area such as water flows and sediment regimes are required.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b></p>

Essex Estuaries SAC: Construction (duration approx 5 years)	
Coastal Squeeze	
	<p>Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats.</p> <p><b>Essex Estuaries CHaMP</b> Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations.</p> <p><b>North and South Essex Flood catchment management plans.</b> Managing flood risk.</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

**Source: Operation (duration approx 60 years)**

<b>Essex Estuaries SAC: Operation (duration approx 60 years)</b>	
<b>Water Resources/ Quality</b>	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water from the marine environment for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SAC: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example by encouraging excessive algal growth. This in turn can affect the composition of habitats.</p> <p>Localised abrasion of habitats can occur around discharge points, which can also result in altered sediment regimes locally. Changes to freshwater inputs through abstraction can affect estuarine ecosystems.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SAC habitats for example toxins may bio-accumulate within plants and may cause deterioration of communities.</p> <p>Biocides used to clean cooling infrastructure have potential impacts on surrounding SAC habitats.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The maintenance of water quality and sediment regime is a key environmental condition requirement of the SAC.</p> <p>Given the proximity of the SAC LSE cannot be ruled out at this stage.</p> <p>Please note: The risk of LSE as a result of accidental radioactive discharge into water is considered to be extremely low due to systems of strict regulatory control.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p>

Essex Estuaries SAC: Operation (duration approx 60 years)	
Water Resources/ Quality	
	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution.</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b> Short term noise and water quality effects</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources.</p>

<b>Essex Estuaries SAC: Operation (duration approx 60 years)</b>	
<b>Water Resources/ Quality</b>	
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Essex Estuaries SAC: Operation (duration approx 60 years)</b>	
<b>Air Quality</b>	
<b>Potential Impacts: Pathway</b>	<p>Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide).</p> <p>Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions.</p>
<b>Potential effects on the SAC: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading and changes to water quality from aerial deposition. This in turn could have impacts on designated communities of the SAC.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Air quality is not specifically identified as a vulnerability for the SAC, although the potential effects of increased nutrient loading from air borne pollutants should be considered.</p> <p>Please note: The risk of LSE as a result of accidental radioactive discharge into air are considered to be extremely low due to systems of strict regulatory control.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Decommissioning of Bradwell Reactor Site</b></p> <p>Water quality, air quality, noise and disturbance</p>

<b>Essex Estuaries SAC: Operation (duration approx 60 years)</b>	
<b>Air Quality</b>	
	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further back-ground environmental condition information required to eliminate aerial emissions as significant at this site.

<b>Essex Estuaries SAC: Operation (duration approx 60 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through operation for example to accommodate waste storage, develop infrastructure Pathways leading to likely significant habitat loss during operation are also related to impacts on water quality/resources. See this section for further information.
<b>Potential effects on the SAC: Receptor</b>	Potential encroachment onto SAC habitats or supporting buffer zones.
<b>Risk of Likely Significant Effect (LSE)?</b>	Any changes to the footprint of the site which encroach onto SAC habitats could have LSE.
<b>Potential Impacts - other Plans and</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>

Essex Estuaries SAC: Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Programmes</b>	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take.</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Decommissioning (duration approx 30 years)

Essex Estuaries SAC: Decommissioning (duration approx 30 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
<b>Potential effects on the SAC: Receptor</b>	<p>Changes in organic and nutrient loading can change the species composition of plants on the saltmarsh and can affect communities on intertidal mudflats for example Eelgrass beds.</p> <p>Changes in sediment regimes can lead to increased turbidity and smothering of coastal/intertidal habitats and their associated species to their detriment. For example reduction of light available for photosynthesis.</p> <p>Contamination by synthetic and non-synthetic compounds is potentially an issue for the estuary mudflats, sandflats and the saltmarshes.</p> <p>Toxins can bind to sediments and bio-accumulate in plants for example saltmarsh plants affecting integrity of habitats and having impacts upon the food chain.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The maintenance of water quality and the existing sedimentary regime is noted as a key environmental condition requirement at this site.</p> <p>Given the proximity of the nominated site to the SAC, there is the potential for significant effects, particularly at a local level.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b></p> <p>Water quality, habitat loss, emissions, noise.</p>

Essex Estuaries SAC: Decommissioning (duration approx 30 years)	
Water Resources/ Quality	
	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution.</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources.</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Essex Estuaries SAC: Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example dust/ particulates.
<b>Potential effects on the SAC: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading, which could impact upon the estuarine plant communities and habitats.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for the SAC, although given the proximity of the designated sites the effects of nutrient loading from air borne pollutants should be investigated further.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further back-ground environmental condition information required to eliminate aerial emissions as significant at this site.

Essex Estuaries SAC: Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities for example to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SAC: Receptor</b>	Potential encroachment onto SAC habitats or supporting buffer zone.
<b>Risk of Likely Significant Effect (LSE)?</b>	Any changes to the footprint of the site which encroach onto SAC habitats could have LSE
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>
<b>Risk from 'In</b>	Yes

<b>Essex Estuaries SAC: Decommissioning (duration approx 30 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Combination' Effects?</b>	
<b>AA Required?</b>	Yes

## Mid-Essex Estuary

Due to the sheer size of the site The Mid Essex Coast Phased SPA/Ramsar complex has been sub-divided into a number of separate phases that have been classified separately. These are: Dengie, Colne Estuary, Crouch and Roach Estuaries, Blackwater Estuary and Foulness SPA/Ramsar sites. It is worth noting however that all the above sites are closely interlinked and many of the key bird species for each of the designations will be moving between sites when feeding and roosting. LSE on the Mid-Essex Coast as a whole are provided below and then further subdivided into the component parts.

### Mid-Essex Estuary SPA/Ramsar Complex

**Unitary Authority:** Essex County Council, Tendring District Council, Maldon District Council, Rochford District Council, Southend Borough Council, Chelmsford Borough Council, Colchester Borough Council

### Source: Construction (duration approx 5 years)

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There may be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example dredging/tunneling/burying could impact on water quality.</p>
<b>Potential effects on the</b>	Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Water Resources/Quality	
<b>SPA/Ramsar: Receptor</b>	<p>species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders.</p> <p>Rare plant and invertebrate communities under the Ramsar designations could also be affected by changes in water quality.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes for Dengie SPA/Ramsar and Blackwater Estuary SPA/Ramsar.</p> <p>Further investigation also required into effects on the Mid-Essex SPA/Ramsar as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Water Resources/Quality	
	<p><b>Bradwell wind farm</b> Short term noise and water quality effects</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading – this could impact on important plant and invertebrate communities helping to contribute to a reduction in species diversity. This could then have knock on effects for the important bird assemblages.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for sites within the complex although given the proximity of some of the designated sites the effects of nutrient loading from air borne pollutants should be investigated further for Dengie and Blackwater Estuary.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further back-ground environmental condition information required to eliminate aerial emissions as significant.

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Habitats (and Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	<p>Potential impacts from: construction for example cooling water culverts, marine landing facility and infrastructure, upgraded coastal protection.</p> <p>Extension of site into 'buffer' habitats, and development at the coastal fringes.</p> <p>Other pathways to possible significant habitat loss during construction are detailed within the water quality/resources and coastal squeeze sections.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any important habitats within the complex could reduce the availability of feeding and roosting habitat for important birds and thus could be detrimental to the favourable condition of component designations.</p> <p>Important saltmarsh communities and important plants and invertebrates listed under the Ramsar designations could also be affected to their detriment.</p> <p>There may also be impacts on the important bird populations if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example damp grassland/grazing marsh is important for many migratory bird species and for waterfowl.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>LSE identified for Dengie SPA/Ramsar site and Blackwater Estuary SPA/Ramsar due their proximity to the nominated site.</p> <p>Uncertainties lie in how this could impact on the Mid-Essex SPA/Ramsar complex as a whole and further investigation is required.</p>

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Habitats (and Species) Loss and Fragmentation	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Coastal Squeeze	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station for example cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Encroachment into the coastal fringe may lead to loss of saltmarsh and other habitats which support important bird assemblages for example through changes to sedimentation regimes (for example resulting in abrasion or siltation)  Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.
<b>Risk of Likely Significant Effect (LSE)?</b>	Yes for Dengie SPA/Ramsar and Blackwater Estuary SPA/Ramsar.  Further investigation also required into effects on the Mid-Essex SPA/Ramsar as a whole.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b> Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Coastal Squeeze	
	<p><b>Essex Estuaries CHaMP</b> Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	<p>The construction phase is anticipated to last for approximately 5 years and there is the potential for a significant increase in noise/ light and visual changes during the construction period. For example through machinery noise, increased vehicular movements and increased personnel present on site.</p> <p>An increase in number of people on site may result in an increase of people utilising the SPA/Ramsar sites locally. Noise impacts are particularly relevant for any activities occurring within the intertidal zone such as the construction of the marine landing facility, cooling culverts and coastal protection upgrades.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance would most likely be disturbance to birds for which the SPA/Ramsars are designated.</p> <p>Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution and tall structures can interrupt flight lines and migration routes.</p> <p>There may also be disturbance impacts on the important bird populations if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes for Dengie SPA/Ramsar and Blackwater SPA/Ramsar due to their proximity to the site.</p> <p>Uncertainties lie in the impacts on the Mid-Essex SPA/Ramsar complex as a whole and further investigation is required.</p>

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p> <p><b>Local Transport Plan</b> Emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p> <p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p>

Mid-Essex Estuary SPA/Ramsar Complex: Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
	<p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with the discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Localised abrasion of habitats can occur around discharge points, which can also result in altered sediment regimes locally. Changes to freshwater inputs through abstraction can affect estuarine ecosystems.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SPA/Ramsar interests for example toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible effects on birds of the SAC/Ramsar which use the habitats in the vicinity of nominated site 8 as a resource for feeding.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species. Both these groups could be adversely impacted by any changes to water quality as a result of operational activities.</p>
<b>Risk of Likely Significant Effect</b>	Yes for Dengie SPA/Ramsar and Blackwater Estuary SPA/Ramsar.

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Water Resources/ Quality	
<b>(LSE)?</b>	Further investigation also required into effects on the Mid-Essex SPA/Ramsar as a whole.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b> Short term noise and water quality effects</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p>

<b>Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)</b>	
<b>Water Resources/ Quality</b>	
	<p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)</b>	
<b>Air Quality</b>	
<b>Potential Impacts: Pathway</b>	<p>Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide).</p> <p>Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading and changes to water quality from aerial deposition. This in turn could have impacts on designated communities and species of the SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for sites within the complex although given the proximity of some of the designated sites the effects of nutrient loading from air borne pollutants should be investigated further for Dengie and Blackwater Estuary.

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Air Quality	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further back-ground environmental condition information required to eliminate aerial emissions as significant.

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Habitats and Species (Loss and Fragmentation)	
<b>Potential Impacts: Pathway</b>	<p>Changes to footprint of site through operation for example to accommodate waste storage, develop infrastructure.</p> <p>Pathways leading to likely significant habitat loss during operation are also related to impacts on water quality/resources. See this section for further information.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat for important birds and thus could be detrimental to the favourable condition of the designations.

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Habitats and Species (Loss and Fragmentation)	
	<p>Important saltmarsh communities and important plants and invertebrates listed under the Ramsar designations could also be affected to their detriment.</p> <p>There may also be impacts on the important bird populations of the SPA/Ramsar if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes for Dengie SPA/Ramsar and Blackwater Estuary.</p> <p>Uncertainties lie in the impacts on the Mid-Essex SPA/Ramsar complex as a whole and further investigation is required.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p>

<b>Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)</b>	
<b>Habitats and Species (Loss and Fragmentation)</b>	
	<p><b>River Basin Management Plan: Anglian River Basin District</b>                      Reduce impact of transport and built environments. Improve wildlife habitats</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)</b>	
<b>Noise/Light/Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	Increased workforce on site could lead to increased human pressure on the SPA/Ramsar features for example through recreation.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsar are designated.</p> <p>Overwintering Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution whilst tall structures can interrupt flight lines and migration routes. For example Bar-tailed Godwits are known to use the site and are one of the key species of the SPA and Ramsar. These birds are under threat from the degradation of foraging sites with human disturbance being a contributing factor.</p> <p>Any disturbance of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl.</p> <p>An increase in number of people on site may result in an increase of people utilising the SPA/Ramsar sites locally. Increased human presence could have an impact on the important bird assemblages of the SPA/Ramsar in terms of disturbance.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes for Dengie SPA/Ramsar and Blackwater Estuary.</p> <p>Uncertainties lie in the impacts on the Mid-Essex SPA/Ramsar complex as a whole and further investigation is required.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b></p> <p>Water quality, habitat loss, emissions, noise</p>

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
	<p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p> <p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p> <p><b>Decommissioning of Bradwell Reactor Site</b></p>

Mid-Essex Estuary SPA/Ramsar Complex: Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
	Water quality, air quality, noise and disturbance
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

### Source: Decommissioning (duration approx 30 years)

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-</p>

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>accumulate toxic compounds and act as sinks for them.</p> <p>Important rare plant and invertebrate species under the Ramsar designations could also be affected.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes for Dengie SPA/Ramsar and Blackwater Estuary SPA/Ramsar.</p> <p>Further investigation also required into effects on the Mid-Essex SPA/Ramsar as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b></p>

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example. dust/ particulates.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading – this could impact on important plant and invertebrate communities of the SPA/Ramsar helping to contribute to a reduction in species diversity. This could then have knock on effects for the important bird assemblages of the SPA/Ramsar.
<b>Risk of Likely Significant Effect</b>	Air quality not a specific identified vulnerability for sites within the complex although given the proximity of some of the designated sites the effects of nutrient loading from air borne pollutants should be investigated further for

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Air Quality	
<b>(LSE)?</b>	Dengie and Blackwater Estuary.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further back-ground environmental condition information required to eliminate aerial emissions as significant.

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance would most likely be disturbance of birds for which the SPA/Ramsar are designated.</p> <p>Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution whilst tall structures can interrupt flight lines and migration routes.</p>

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	<p>There may also be disturbance impacts on the important bird populations if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example. damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Yes for Dengie SPA/Ramsar and Blackwater SPA/Ramsar due to their proximity to the site.</p> <p>Uncertainties lie in the impacts on the Mid-Essex SPA/Ramsar complex as a whole and further investigation is required.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b></p>

Mid-Essex Estuary SPA/Ramsar Complex: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	Recreational disturbance  <b>Rochford Local Development Framework</b> Potential increased recreational use
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Dengie SPA/Ramsar (Mid-Essex Coast Phase 1)

**Unitary Authority:** Essex County Council, Maldon District Council

**Source: Construction (duration approx 5 years)**

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There may be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example. dredging/tunneling/burying could impact on water quality.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. eel grass beds are an important food source for Dark Bellied Brent Geese and Knot are specialist feeders on molluscs such as cockles.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts on in the wider context on the Mid-Essex SPA Ramsar complex as a whole due to birds moving</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Water Resources/Quality	
	between designations.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is for water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting to be maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>Given the proximity of the SPA/Ramsar site impacts associated with water quality as a result of construction activities cannot be ruled out at this stage.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b></p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Water Resources/Quality	
	<p>Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example. dust/ particulates.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading – this could impact on important plant and invertebrate communities of the SPA/Ramsar helping to contribute to a reduction in species diversity. This could then have knock on effects for the important bird assemblages of the SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for the SPA/ Ramsar, although given the proximity of the designation further investigation into the impacts of nutrient loading from air borne pollution should be undertaken.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further background environmental condition information required to eliminate aerial emissions as significant at this site.

<b>Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)</b>	
<b>Habitats and Species (Loss and Fragmentation)</b>	
<b>Potential Impacts: Pathway</b>	<p>Potential impacts from: construction for example. cooling water culverts, marine landing facility and infrastructure, upgraded coastal protection.</p> <p>Extension of site into 'buffer' habitats, and development at the coastal fringes.</p> <p>Other pathways to possible significant habitat loss during construction are detailed within the water quality/resources and coastal squeeze sections.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat for important birds and thus could be detrimental to the favourable condition of the designations.</p> <p>Important saltmarsh communities and important plants and invertebrates could also be affected to their detriment. (Ramsar criterion 1, 2 and 3)</p> <p>There may also be impacts on the important bird populations of the SPA/Ramsar if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example. damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Any loss of habitat used by the important bird assemblages of the SPA could result in a likely significant effect.</p> <p>Likewise loss of any rare plants or invertebrates as listed under the Ramsar designation would also have significant effects.</p> <p>Given the proximity of the designation to the nominated site LSE cannot be ruled out.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Habitats and Species (Loss and Fragmentation)	
	<p>Mid-Essex SPA/Ramsar complex as a whole.</p> <p>LSE may also be associated with loss of habitat through other pathways such as changes in water quality or knock on effects from coastal protection measures.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats.</p> <p><b>Essex Flood Management Strategies</b> Coastal squeeze</p>

<b>Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)</b>	
<b>Habitats and Species (Loss and Fragmentation)</b>	
	<b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)</b>	
<b>Coastal Squeeze</b>	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station for example. cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Encroachment into the coastal fringe may lead to loss of saltmarsh and other habitats which support important bird assemblages of the SPA/Ramsar for example. through changes to sedimentation regimes (for example. resulting in abrasion or siltation).</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The main threat to the SPA/Ramsar site is erosion of intertidal habitats. Development along the coastal fringe is a contributing factor to this problem.</p> <p>Given the proximity of the designated site, LSE on the SPA/Ramsar habitats cannot be ruled out at this stage.</p> <p>Further understanding of the coastal processes in the area such as water flows and sediment regimes required.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b></p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p>Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p> <p><b>Essex Estuaries CHaMP</b> Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	<p>The construction phase is anticipated to last for approximately 5 years and there is the potential for a significant increase in noise/ light and visual changes during the construction period. For example through machinery noise, increased vehicular movements and increased personnel present on site.</p> <p>An increase in number of people on site may result in an increase of people utilising the SPA/Ramsar sites locally.</p> <p>Noise impacts are particularly relevant for any activities occurring within the intertidal zone such as the construction of the marine landing facility, cooling culverts and coastal protection upgrades.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsars are designated.</p> <p>Overwintering birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds for example. Bar-tailed Godwits are known to use the site and are one of the key species of the SPA and Ramsar. These birds are under threat from the degradation of foraging sites with human disturbance being a contributing factor.</p> <p>There may also be disturbance impacts on the important bird populations of the SPA/Ramsar if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example. damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The SPA/Ramsar site falls adjacent to the nominated site. One of the key requirements for the important bird assemblages is minimal disturbance. Any increased noise disturbance as a result of construction could therefore have a likely significant effect.</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
	<p>If habitats close to the nominated site are used by birds of the SPA/Ramsar this could lead to likely significant impacts on the SPA/Ramsar if for example birds are displaced.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b></p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
	<p>Increased recreational pressure</p> <p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock and Rochford)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Water Resources/ Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example. by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Localised abrasion of habitats can occur around discharge points, which can also result in altered sediment regimes locally. Changes to freshwater inputs through abstraction can affect estuarine ecosystems.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SPA/Ramsar interests for example. toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible effects on birds of the SAC/Ramsar which use the habitats in the vicinity of nominated site 8 as a resource for feeding.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of operational activities.</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Water Resources/ Quality	
	Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>Given the proximity of the SPA/Ramsar to the nominated site it is not possible to rule out any likely significant impacts at this stage.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Water Resources/ Quality	
	<p><b>Bradwell wind farm</b> Short term noise and water quality effects</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide).</p> <p>Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading and changes to water quality from aerial deposition. This in turn could have impacts on designated communities and species of the SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for the SPA/ Ramsar, although given the proximity of the designation further investigation into the impacts of nutrient loading from air borne pollution should be undertaken.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further background environmental condition information required to eliminate aerial emissions as significant at this site.

<b>Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	<p>Changes to footprint of site through operation for example. to accommodate waste storage, develop infrastructure</p> <p>Pathways leading to likely significant habitat loss during operation are also related to impacts on water quality/resources. See this section for further information.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat for important birds and thus could be detrimental to the favourable condition of the designations.</p> <p>Important saltmarsh communities and important plants and invertebrates could also be affected to their detriment. (Ramsar criterion 1, 2 and 3)</p> <p>There may also be impacts on the important bird populations of the SPA/Ramsar if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example. damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Given the proximity of the SPA/Ramsar to the nominated site significant effects cannot be ruled out. LSE would also be associated with loss of habitat through other pathways such as changes in water quality.</p> <p>If habitats outside the SPA/Ramsar boundary and close to the nominated site are used by birds of the SPA/Ramsar this could also lead to likely significant impacts on the SPA/Ramsar if such habitats are to be lost.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts -</b>	<b>Essex County Council Minerals and Waste Development Framework</b>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
<b>other Plans and Programmes</b>	<p>Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts:</b>	Increased workforce on site could lead to increased human pressure on the SPA/Ramsar features for example

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Pathway</b>	through recreation.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsars are designated.</p> <p>Overwintering Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution whilst tall structures can interrupt flight lines and migration routes. For example. Bar-tailed Godwits are known to use the site and are one of the key species of the SPA and Ramsar. These birds are under threat from the degradation of foraging sites with human disturbance being a contributing factor.</p> <p>Any disturbance of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example. damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl.</p> <p>An increase in number of people on site may result in an increase of people utilising the SPA/Ramsar sites locally. Increased human presence could have an impact on the important bird assemblages of the SPA/Ramsar in terms of disturbance.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The SPA/Ramsar site falls adjacent to the nominated site. One of the key requirements for the important bird assemblages is minimal disturbance. Any increased noise disturbance as a result of operation could therefore have a likely significant effect.</p> <p>If habitats close to the nominated site are used by birds of the SPA/Ramsar this could lead to likely significant</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
	<p>impacts on the SPA/Ramsar if for example birds are displaced.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
	<p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

**Source: Decommissioning (duration approx 30 years)**

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. Eel grass beds are an important food source for Dark Bellied Brent Geese and Knot are specialist feeders on molluscs such as cockles.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities. Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>Given the proximity of the SAC/Ramsar site likely significant impacts as a result of changes to water quality cannot be ruled out.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts -</b>	

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>AA Required?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example. dust/ particulates.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading – this could impact on important plant and invertebrate communities of the SPA/Ramsar helping to contribute to a reduction in species diversity. This could then have knock on effects for the important bird assemblages of the SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for the SPA/ Ramsar, although given the proximity of the designation further investigation into the impacts of nutrient loading from air borne pollution should be undertaken.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>
<b>Risk from 'In Combination' Effects?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Air Quality	
<b>AA Required?</b>	Further background environmental condition information required to eliminate aerial emissions as significant at this site

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities for example. to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat for important birds and thus could be detrimental to the favourable condition of the designations. Important saltmarsh communities and important plants and invertebrates could also be affected to their detriment. (Ramsar criterion 1, 2 and 3)</p> <p>There may also be impacts on the important bird populations of the SPA/Ramsar if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example. damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Any loss of habitat used by the important bird assemblages of the SPA could result in a likely significant effect.</p> <p>Likewise loss of any rare plants or invertebrates as listed under the Ramsar designation would also have significant</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	<p>effects.</p> <p>Given the proximity of the designation to the nominated site LSE cannot be ruled out.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p> <p>LSE may also be associated with loss of habitat through other pathways such as changes in water quality or knock on effects from coastal protection measures.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	<p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsars are designated.</p> <p>Overwintering Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution and if tall structures interrupt flight lines and migration routes. For example. Bar-tailed Godwits are known to use the site and are one of the key species of the SPA and</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	<p>Ramsar. These birds are under threat from the degradation of foraging sites with human disturbance being a contributing factor.</p> <p>Any disturbance of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example, damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The SPA/Ramsar site falls adjacent to the nominated site. One of the key requirements for the important bird assemblages is minimal disturbance. Any increased noise disturbance as a result of operation could therefore have a likely significant effect.</p> <p>If habitats close to the nominated site are used by birds of the SPA/Ramsar this could lead to likely significant impacts on the SPA/Ramsar if for example birds are displaced.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p>

Dengie SPA/Ramsar (Mid-Essex Coast Phase 1): Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	<p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Colne Estuary

No impacts anticipated from air quality due to distance from the nominated site. Impacts on habitat loss/fragmentation and noise and disturbance are considered to impact birds only and are considered in the context of the Mid-Essex SPA/Ramsar complex as a whole. They are therefore not included below.

### Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2)

**Unitary Authority:** Essex County Council, Tendring District Council, Colchester Borough Council

### Source: Construction (duration approx 5 years)

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There will be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example. dredging/tunneling/burying could impact on water quality.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may</p>

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)	
Water Resources/Quality	
	<p>cause reductions in prey items and food sources for waterfowl and waders for example. Eel grass beds are an important food source for Dark Bellied Brent Geese and Knot are specialist feeders on molluscs such as cockles.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>Although the SPA /Ramsar is approximately 5km from the nominated site it is difficult to rule out the risk of LSE given the dynamic nature of estuarine systems and the fact that contaminants can disperse over large distances in water.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)	
Water Resources/Quality	
	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)</b>	
<b>Coastal Squeeze</b>	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station for example. cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Encroachment into the coastal fringe may lead to loss of saltmarsh and other habitats which support important bird assemblages /plants/invertebrates of the SPA/Ramsar for example. through changes to sedimentation regimes (for

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p>example. resulting in abrasion or siltation)</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The main threats identified to this SPA/Ramsar are coastal squeeze and changes to sediment budget.</p> <p>Despite the SPA/Ramsar being 5km away from the nominated site LSE cannot be ruled out at this stage given the dynamic nature of estuarine systems and the fact that coastal development activities in one area could have knock on effects in other areas, even those of considerable distance away.</p> <p>Further understanding of the coastal processes in the area such as water flows and sediment regimes required.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b> Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p><b>Essex Estuaries CHaMP</b> Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect</b>	See Mid –Essex Coast SPA/Ramsar

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Construction (duration approx 5 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>(LSE)?</b>	
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example. by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SPA/Ramsar interests for example. toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible indirect effects on birds of the SAC/Ramsar which use the habitats in the vicinity of the nominated site as a resource for feeding.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of operational activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>Although the SPA/Ramsar site is approximately 5km away it is not possible to rule out LSE through water quality pathways due to the dynamic nature of estuaries and the fact that contaminants can spread easily in water and over considerable distances.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b> Short term noise and water quality effects</p>

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)	
Water Resources/Quality	
	<p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	See Mid-Essex Coast SPA/Ramsar

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and</b>	See Mid-Essex Coast SPA/Ramsar

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Operation (duration approx 60 years)	
Noise/ Light/ Visual Disturbance	
<b>Programmes</b>	
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Decommissioning (duration approx 30 years)

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. Eel grass beds are an important food source for Dark Bellied Brent Geese and Knot are specialist feeders on molluscs such as cockles.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect</b>	A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>(LSE)?</b>	<p>maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>Although the SPA /Ramsar is approximately 5km from the nominated site it is difficult to rule out the risk of LSE given the dynamic nature of estuarine systems and the fact that contaminants can disperse over large distances in water.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p>

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and</b>	See Mid-Essex Coast SPA/Ramsar

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Decommissioning (duration approx 30 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Programmes</b>	
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2): Decommissioning (duration approx 30 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid-Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid-Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Crouch and Roach Estuaries

No impacts anticipated from air quality due to distance from the nominated site. Impacts on habitat loss/fragmentation and noise and disturbance are considered to impact birds only and are considered in the context of the Mid-Essex SPA/Ramsar complex as a whole. They are therefore not included below.

### Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3)

**Unitary Authority:** Essex County Council, Maldon District Council, Rochford District Council

#### Source: Construction (duration approx 5 years)

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There will be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example. dredging/ tunneling/ burying could impact on water quality.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may</p>

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)	
Water Resources/Quality	
	<p>cause reductions in prey items and food sources for waterfowl and waders for example. eel grass beds are an important food source for Dark Bellied Brent Geese.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>The SPA/Ramsar is approximately 13km from the nominated site however it is difficult to rule out the risk of LSE given the dynamic nature of estuarine systems and the fact that contaminants can disperse over large distances in water.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b></p>

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)	
Water Resources/Quality	
	<p>Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)</b>	
<b>Coastal Squeeze</b>	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station for example. cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Encroachment into the coastal fringe may lead to loss of saltmarsh and other habitats which support important bird assemblages /plants/invertebrates of the SPA/Ramsar for example. through changes to sedimentation regimes (for example. resulting in abrasion or siltation)

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)	
Coastal Squeeze	
	Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>One of the main threats to the SPA/Ramsar is coastal squeeze and changes to sediment budget.</p> <p>Despite the SPA/Ramsar being of considerable distance from the nominated site LSE cannot be ruled out at this stage given the dynamic nature of estuarine systems and the fact that coastal development activities in one area could have knock on effects in other areas, even those of considerable distance away.</p> <p>Further understanding of the coastal processes in the area such as water flows and sediment regimes required.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b> Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p> <p><b>Essex Estuaries CHaMP</b></p>

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p>Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely</b>	See Mid –Essex Coast SPA/Ramsar

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Construction (duration approx 5 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Significant Effect (LSE)?</b>	
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example. by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SPA/Ramsar interests for example. toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible indirect effects on birds of the SAC/Ramsar which use the habitats in the vicinity of the nominated site as a resource for feeding.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of operational activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>Although the SPA/Ramsar site is approximately 13km away it is not possible to rule out LSE through water quality pathways due to the dynamic nature of estuaries and the fact that contaminants can spread easily in water and over considerable distances.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b> Short term noise and water quality effects</p>

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)	
Water Resources/Quality	
	<p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts -</b>	See Mid –Essex Coast SPA/Ramsar

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Operation (duration approx 60 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>other Plans and Programmes</b>	
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Decommissioning (duration approx 30 years)

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. Eel grass beds are an important food source for Dark Bellied Brent Geese.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities. Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>Although the SPA /Ramsar is approximately 13km from the nominated site it is difficult to rule out the risk of LSE given the dynamic nature of estuarine systems and the fact that contaminants can disperse over large distances in water.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p>

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources.</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Environmental condition: information</b> River Basin Management Plan</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes



<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Decommissioning (duration approx 30 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Decommissioning (duration approx 30 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts -</b>	See Mid –Essex Coast SPA/Ramsar

Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3): Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
other Plans and Programmes	
Risk from 'In Combination' Effects?	Yes
AA Required?	Yes

## Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4)

**Unitary Authority:** Essex County Council, Maldon District Council

**Source: Construction (duration approx 5 years)**

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There will be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example. dredging/ tunneling/ burying could impact on water quality.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Water Resources/Quality	
	<p>require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish, similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. eel grass beds are an important food source for Dark Bellied Brent Geese.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance invertebrate species, which could also be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.</p> <p>In addition changes in water quality could have LSE on rare invertebrate species which are identified under Ramsar criterion 2.</p> <p>Given the proximity of the SPA/Ramsar to the nominated site there is a considerable risk of likely significant impacts.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Water Resources/Quality	
	Mid-Essex SPA/Ramsar complex as a whole.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution.</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>

<b>Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)</b>	
<b>Water Resources/Quality</b>	
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example. dust/ particulates.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading – this could impact on important plant and invertebrate communities of the SPA/Ramsar helping to contribute to a reduction in species diversity. This could then have knock on effects for the important bird assemblages of the SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for the SPA/ Ramsar, although given the proximity of the designation further investigation into the impacts of nutrient loading from air borne pollution should be undertaken.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further background environmental condition information required to eliminate aerial emissions as significant at this site.

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Potential Impacts: Pathway</b>	<p>Potential impacts from: construction for example. cooling water culverts, marine landing facility and infrastructure, upgraded coastal protection.</p> <p>Extension of site into ‘buffer’ habitats, and development at the coastal fringes.</p> <p>Other pathways to possible significant habitat loss during construction are detailed within the water quality/resources and coastal squeeze sections.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat and thus could be detrimental to the favourable condition of the SPA interest features such as the important bird assemblages of the SPA and Ramsar as well as saltmarsh communities and important plants and invertebrates. (Ramsar criterion 1, 2 and 3)</p> <p>Any loss of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself for example. damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl. Such as Golden Plover, Dark Bellied Brent Geese and Hen Harrier.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Direct loss of habitat within the SPA/Ramsar could result in significant effects.</p> <p>Other significant effects would most likely be associated with loss of habitat through other pathways such as changes in water quality or knock on effects from coastal protection measures.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p> <p><b>Essex Flood Management Strategies</b> Coastal squeeze</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Coastal Squeeze	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station for example. cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Encroachment into the coastal fringe may lead to loss of saltmarsh and other habitats which support important bird assemblages /invertebrates of the SPA/Ramsar for example. through changes to sedimentation regimes (for example. resulting in abrasion or siltation)</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>One of the main threats to the SPA/Ramsar is erosion of intertidal habitats.</p> <p>As the SPA/Ramsar is in close proximity to the nominated site LSE cannot be ruled out at this stage.</p> <p>Further understanding of the coastal processes in the area such as water flows and sediment regimes required.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p><b>Renewable Energy strategy</b> Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p> <p><b>Essex Estuaries CHaMP</b> Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	<p>The construction phase is anticipated to last for approximately 5 years and there is the potential for a significant increase in noise/ light and visual changes during the construction period. For example through machinery noise, increased vehicular movements and increased personnel present on site. For example. An increase in number of people on site may result in an increase of people utilising the SPA/Ramsar sites locally. Increased human presence could have an impact on the important bird assemblages of the SPA/Ramsar in terms of disturbance.</p> <p>Noise impacts are particularly relevant for any activities occurring within the intertidal zone such as the construction of the marine landing facility, cooling culverts and coastal protection upgrades.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise, light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsars are designated (for example Little Tern which breed within the SPA/Ramsar are very susceptible to disturbance which can lead to nest failure. Overwintering birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution whilst tall structures interrupt flight lines and migration routes. For example. Bar-tailed Godwits are known to use the site and are one of the key species of the SPA and Ramsar. These birds are under threat from the degradation of foraging sites with human disturbance being a contributing factor.</p> <p>Any disturbance of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example. damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect</b>	<p>The SPA/Ramsar site falls adjacent to the nominated site. One of the key requirements for the important bird assemblages is minimal disturbance. Any increased noise disturbance as a result of construction could therefore</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>(LSE)?</b>	<p>have a likely significant effect. If habitats close to the nominated site are used by birds of the SPA/Ramsar this could lead to likely significant impacts on the SPA/Ramsar if for example birds are displaced.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
	<p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock and Rochford)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example. by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Localised abrasion of habitats can occur around discharge points, which can also result in altered sediment regimes locally. Changes to freshwater inputs through abstraction can affect estuarine ecosystems.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SPA/Ramsar interests for example. toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible indirect effects on birds of the SAC/Ramsar which use the habitats in the vicinity of the nominated site as a resource for feeding.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of operational activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Water Resources/Quality	
	between designations
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>Given the proximity of the SPA/Ramsar to the nominated site it is not possible to rule out any likely significant impacts at this stage.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b></p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Water Resources/Quality	
	<p>Short term noise and water quality effects</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide).</p> <p>Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>An increase in airborne pollutants can lead to nutrient loading and changes to water quality from aerial deposition. This in turn could have impacts on designated communities and species of the SPA/Ramsar.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Air quality not a specific identified vulnerability for the SPA/Ramsar, although the potential effects of airborne pollutants dispersed by wind should be considered.</p> <p>Please note: The risk of LSE as a result of accidental radioactive discharge into air are considered to be extremely low due to systems of strict regulatory control.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	<p>Yes</p>
<b>AA Required?</b>	<p>Further back-ground environmental condition information required to eliminate aerial emissions as significant at this site.</p>

<b>Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	<p>Changes to footprint of site through operation, for example to accommodate waste storage, develop infrastructure</p> <p>Pathways leading to likely significant habitat loss during operation are also related to impacts on water quality/resources. See this section for further information.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat for important birds and thus could be detrimental to the favourable condition of the designations. Important saltmarsh communities and important plants and invertebrates could also be affected to their detriment. (Ramsar criterion 1, 2 and 3)</p> <p>There may also be impacts on the important bird populations of the SPA/Ramsar if they use habitat in close proximity to the site that falls outside of the SPA/Ramsar boundary for example. damp grassland/grazing marsh is important for many migratory bird species and for water birds and wildfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Given the proximity of the SPA/Ramsar to the nominated site significant effects cannot be ruled. LSE would also be associated with loss of habitat through other pathways such as changes in water quality</p> <p>If habitats outside the SPA/Ramsar boundary and close to the nominated site are used by birds of the SPA/Ramsar this could also lead to likely significant impacts on the SPA/Ramsar if such habitats are to be lost.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts -</b>	<b>Essex County Council Minerals and Waste Development Framework</b>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
<b>other Plans and Programmes</b>	<p>Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality, land take</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Essex Renewable energy strategy</b> Promotion of onshore and offshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Potential Impacts:</b>	Increased workforce on site could lead to increased human pressure on the SPA/Ramsar features for example

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
<b>Pathway</b>	through recreation.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsars are designated.</p> <p>Overwintering birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution and if tall structures interrupt flight lines and migration routes. For example. Little Terns are particularly susceptible to disturbance and are a key species of the SPA/Ramsar.</p> <p>Any disturbance of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example. damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl such as Golden Plover and Dark Bellied Brent Geese.</p> <p>An increase in number of people on site may result in an increase of people utilising the SPA/Ramsar sites locally. Increased human presence could have an impact on the important bird assemblages of the SPA/Ramsar in terms of disturbance.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The SPA/Ramsar site falls adjacent to the nominated site. One of the key requirements for the important bird assemblages is minimal disturbance. Any increased noise disturbance as a result of operation could therefore have a likely significant effect.</p> <p>If habitats close to the nominated site are used by birds of the SPA/Ramsar this could lead to likely significant</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
	<p>impacts on the SPA/Ramsar if for example birds are displaced.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Operation (duration approx 60 years)	
Noise/Light/Visual Disturbance	
	<p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

### Source: Decommissioning (duration approx 30 years)

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish; similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. Eel grass beds are an important food source for Dark Bellied Brent Geese.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>In addition changes in water quality could have LSE on rare invertebrate species which are identified under Ramsar criterion 2.</p> <p>Given the proximity of the SAC/Ramsar site likely significant impacts as a result of changes to water quality cannot be ruled out.</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution.</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>

<b>Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)</b>	
<b>Water Resources/Quality</b>	
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and emissions arising from decommissioning activity. Likely to be restricted to a local level for example. dust/ particulates.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading – this could impact on important plant and invertebrate communities of the SPA/Ramsar helping to contribute to a reduction in species diversity. This could then have knock on effects for the important bird assemblages of the SPA/Ramsar.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality not a specific identified vulnerability for the SPA/ Ramsar, although given the proximity of the designation further investigation into the impacts of nutrient loading from air borne pollution should be undertaken.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Further background environmental condition information required to eliminate aerial emissions as significant at this site.

<b>Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)</b>	
<b>Habitats and Species (Loss and Fragmentation)</b>	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities, for example to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Loss or fragmentation of any habitat within the SPA/Ramsar site could reduce the availability of feeding and roosting habitat and thus could be detrimental to the favourable condition of the SPA interest features such as the important bird assemblages of the SPA and Ramsar as well as saltmarsh communities and important plants and invertebrates. (Ramsar criterion 1, 2 and 3)</p> <p>Any loss of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example. Damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Any direct loss of habitat could result in LSE.</p> <p>LSE would be associated with loss of habitat through other pathways such as changes in water quality. If habitats closer to the nominated site are used by birds of the SPA/Ramsar this could also lead to likely significant impacts on the SPA/Ramsar if such habitats are to be lost.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b></p> <p>Water quality, habitat loss, emissions, noise</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Habitats and Species (Loss and Fragmentation)	
	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated de-construction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of overwintering birds for which the SPA/Ramsars are designated. (For example, Little Terns breed on site and are very susceptible to disturbance which can lead to nest failure.</p> <p>Overwintering birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution and if tall structures interrupt flight lines and migration routes. For example, Bar-tailed Godwits are known to use the site and are one of the key species of the SPA and Ramsar. These birds are under threat from the degradation of foraging sites with human disturbance being a contributing factor.</p> <p>Any disturbance of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could also have an impact on the favourable condition of the SPA/Ramsar site itself. For example, damp grassland/grazing marsh habitats are important as feeding areas for many migratory species and waterfowl.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>The SPA/Ramsar site falls adjacent to the nominated site. One of the key requirements for the important bird assemblages is minimal disturbance. Any increased noise disturbance as a result of decommissioning could therefore have a likely significant effect.</p> <p>If habitats close to the nominated site are used by birds of the SPA/Ramsar this could lead to likely significant impacts on the SPA/Ramsar if for example birds are displaced.</p>

Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4): Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Foulness

No impacts anticipated from air quality due to distance from the nominated site. Impacts on habitat loss/fragmentation and noise and disturbance are considered to impact birds only and are considered in the context of the Mid-Essex SPA/Ramsar complex as a whole. They are therefore not included below.

### Foulness SPA/Ramsar (Mid-Essex Coast Phase 5)

Unitary Authority: Essex County Council, Rochford District Council

### Source: Construction (duration approx 5 years)

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example. increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There will be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these for example. dredging/ tunneling/ burying could impact on water quality.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish; similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may</p>

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)</b>	
<b>Water Resources/Quality</b>	
	<p>cause reductions in prey items and food sources for waterfowl and waders for example. eel grass beds are an important food source for Dark Bellied Brent Geese.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within the food chain. This could damage the integrity of habitats for example. saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>The SPA/Ramsar is approximately 12.5km from the nominated site however it is difficult to rule out the risk of LSE given the dynamic nature of estuarine systems and the fact that contaminants can disperse over large distances in water.</p> <p>There is also some uncertainty regarding LSE in the wider context of the Mid-Essex SPA/Ramsar as a whole.</p>
<b>Potential Impacts - other Plans and</b>	<b>Essex County Council Minerals and Waste Development Framework</b>

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)	
Water Resources/Quality	
<b>Programmes</b>	<p>Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources.</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)</b>	
<b>Coastal Squeeze</b>	
<b>Potential Impacts: Pathway</b>	<p>Construction of infrastructure and facilities relating to the operation of the nuclear power station, for example cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes.</p> <p>All supporting habitats are sensitive to removal by land reclamation and construction activity.</p>
<b>Potential effects on the SPA/Ramsar: Receptor</b>	Encroachment into the coastal fringe may lead to loss of saltmarsh and other habitats which support important bird assemblages /plants/invertebrates of the SPA/Ramsar for example. through changes to sedimentation regimes (for

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p>example. resulting in abrasion or siltation)</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>One of the main threats to the SPA/Ramsar is erosion.</p> <p>Despite the SPA/Ramsar being of considerable distance from the nominated site LSE cannot be ruled out at this stage given the dynamic nature of estuarine systems and the fact that coastal development activities in one area could have knock on effects in other areas, even those of considerable distance away.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b> Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p> <p><b>Essex Estuaries CHaMP</b></p>

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)	
Coastal Squeeze	
	<p>Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely</b>	See Mid –Essex Coast SPA/Ramsar

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Construction (duration approx 5 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Significant Effect (LSE)?</b>	
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example. by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Localised abrasion of habitats can occur around discharge points, which can also result in altered sediment regimes locally. Changes to freshwater inputs through abstraction can affect estuarine ecosystems.</p> <p>Accidental release of pollutants entering the estuarine system may impact on key SPA/Ramsar interests for example. toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible indirect effects on birds of the SAC/Ramsar which use the habitats in the vicinity of the nominated site as a resource for feeding.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of operational activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving</p>

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Operation (duration approx 60 years)	
Water Resources/Quality	
	between designations.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>Although the SPA/Ramsar site is approximately 12.5km away it is not possible to rule out LSE through water quality pathways due to the dynamic nature of estuaries and the fact that contaminants can spread easily in water and over considerable distances.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p> <p><b>Bradwell wind farm</b> Short term noise and water quality effects</p>

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Operation (duration approx 60 years)	
Water Resources/Quality	
	<p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Operation (duration approx 60 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Operation (duration approx 60 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Operation (duration approx 60 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from ‘In Combination’ Effects?</b>	Yes
<b>AA Required?</b>	Yes

### Source: Decommissioning (duration approx 30 years)

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example, increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA/Ramsar: Receptor</b>	<p>Increased nutrient input may affect species composition of habitats within the SPA/Ramsar causing a reduction in species richness. This could cause a reduction in food sources and prey items which birds of the SPA/Ramsar require.</p> <p>Changes to sediment regimes and increased turbidity /siltation could affect filter feeding shellfish; similarly important plants of coastal and intertidal habitats may be affected through smothering for example. eelgrass beds. Both may cause reductions in prey items and food sources for waterfowl and waders for example. Eel grass beds are an important food source for Dark Bellied Brent Geese.</p> <p>Any release of toxins could impact on important bird assemblages of the SPA/Ramsar through accumulation within</p>

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>the food chain. This could damage the integrity of habitats, for example saltmarsh plants are known to bio-accumulate toxic compounds and act as sinks for them.</p> <p>Ramsar criterion 2 identifies the site as being of importance for rare plant and invertebrate species, both these groups could be adversely impacted by any changes to water quality as a result of construction activities.</p> <p>Possible impacts in a wider context on the Mid-Essex SPA/Ramsar complex as a whole due to birds moving between designations.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.</p> <p>In addition changes in water quality could have LSE on rare plant or invertebrate species which are identified under Ramsar criterion 2.</p> <p>Although the SPA /Ramsar is approximately 12.5km from the nominated site it is difficult to rule out the risk of LSE given the dynamic nature of estuarine systems and the fact that contaminants can disperse over large distances in water.</p> <p>There is also some uncertainty regarding LSE in the wider area. This needs to be investigated in the context of the Mid-Essex SPA/Ramsar complex as a whole.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p>

Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats.</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Avoid pollution</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p>
<b>Risk from 'In Combination' Effects?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)</b>	
<b>Water Resources/Quality</b>	
<b>AA Required?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	See Mid –Essex Coast SPA/Ramsar
<b>Potential effects on the SPA/Ramsar: Receptor</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk of Likely Significant Effect (LSE)?</b>	See Mid –Essex Coast SPA/Ramsar

<b>Foulness SPA/Ramsar (Mid-Essex Coast Phase 5): Decommissioning (duration approx 30 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts - other Plans and Programmes</b>	See Mid –Essex Coast SPA/Ramsar
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Abberton Reservoir

Abberton Reservoir does not fall within the Mid-Essex Coast SPA/Ramsar complex however it is closely linked due to important bird species moving between the two sites. No impacts anticipated from air quality due to distance from the nominated site.

### Abberton Reservoir SPA

**Unitary Authority:** Essex County Council, Colchester District Council

### Source: Construction (duration approx 5 years)

Abberton Reservoir SPA: Construction (duration approx 5years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example, increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA: Receptor</b>	Any release of toxins/pollutants could impact on important bird assemblages of the SPA/Ramsar. Any birds feeding along the coastline where contaminants may be released may suffer through accumulation of toxins within the food chain.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Although the SPA/Ramsar is 8km from the nominated site, it has a key role as a roost for wildfowl and waders feeding in adjacent estuarine areas, which includes those falling adjacent to the nominated site.</p> <p>Any LSE would most likely be associated with release of pollutants/toxins which could impact birds of the SPA/Ramsar through accumulation in the food chain.</p>

Abberton Reservoir SPA: Construction (duration approx 5years)	
Water Resources/Quality	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p> <p><b>Raising of Abberton Reservoir</b> Overall positive effect due to creation of wetland habitat</p>
<b>Risk from 'In Combination' Effects?</b>	Yes

<b>Abberton Reservoir SPA: Construction (duration approx 5years)</b>	
<b>Water Resources/Quality</b>	
<b>AA Required?</b>	Yes

<b>Abberton Reservoir SPA: Construction (duration approx 5years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	<p>Potential impacts from: construction, for example cooling water culverts, marine landing facility and infrastructure, upgraded coastal protection.</p> <p>Extension of site into 'buffer' habitats, and development at the coastal fringes.</p>
<b>Potential effects on the SPA: Receptor</b>	Any loss of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could have an impact on the favourable condition of the SPA/Ramsar site itself.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Direct loss of habitat within the SPA/Ramsar is considered unlikely given its distance from the nominated site.</p> <p>There is uncertainty regarding LSE as a result of habitat loss outside the SPA/Ramsar (for example. due to habitat loss within the Mid-Essex SPA/Ramsar complex for example). This needs to be investigated further.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Abberton Reservoir</b></p> <p>Overall positive effect due to creation of wetland habitat</p>
<b>Risk from 'In Combination' Effects?</b>	Yes

<b>Abberton Reservoir SPA: Construction (duration approx 5years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>AA Required?</b>	Yes

<b>Abberton Reservoir SPA: Construction (duration approx 5years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	<p>The construction phase is anticipated to last for approximately 5 years and there is the potential for a significant increase in noise/ light and visual changes during the construction period. For example through machinery noise, increased vehicular movements and increased personnel present on site.</p> <p>Noise impacts are particularly relevant for any activities occurring within the intertidal zone such as the construction of the marine landing facility, cooling culverts and coastal protection upgrades.</p>
<b>Potential effects on the SPA: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of birds for which the SPA/Ramsars are designated if they use habitats in close proximity to the nominated site.</p> <p>Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution whilst tall structures can interrupt flight lines and migration routes.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>As the SPA/Ramsar site is 8km from the nominated site direct impacts due to noise/light/visual disturbance are not anticipated.</p> <p>There is uncertainty regarding LSE as a result of disturbance outside the SPA/Ramsar. This needs to be investigated further.</p>

Abberton Reservoir SPA: Construction (duration approx 5years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p> <p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p> <p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p>

<b>Abberton Reservoir SPA: Construction (duration approx 5years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
	<b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Abberton Reservoir SPA: Construction (duration approx 5years)</b>	
<b>Coastal Squeeze</b>	
<b>Potential Impacts: Pathway</b>	Construction of infrastructure and facilities relating to the operation of the nuclear power station, for example cooling culverts, marine landing facility and upgraded coastal protection will result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
<b>Potential effects on the SPA: Receptor</b>	The main impacts of coastal on the SPA/Ramsar would most likely be disturbance of birds for which the SPA/Ramsar is designated if they use habitats under threat from coastal squeeze in close proximity to the nominated site.
<b>Risk of Likely Significant Effect (LSE)?</b>	There is uncertainty regarding LSE on the SPA/Ramsar as a result of coastal squeeze. Given its location close to the coast this needs to be investigated further.
<b>Potential Impacts - other Plans and</b>	<b>Maldon Core Strategy</b> Coastal squeeze, disturbance, recreation, water quality

Abberton Reservoir SPA: Construction (duration approx 5years)	
Coastal Squeeze	
<b>Programmes</b>	<p><b>Chelmsford Core Strategy</b> Recreation, land take, disturbance</p> <p><b>Renewable Energy strategy</b> Promotion of offshore and onshore windfarms</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Reduce impact of transport and built environments. Improve wildlife habitats</p> <p><b>Essex Estuaries CHaMP</b> Flood and coastal defence options to address requirements of Habitat Regulations</p> <p><b>East Anglian Strategies (Shoreline Management Plans)</b> Policies for sustainable management of the coast (under development)</p> <p><b>Flood Management Strategies (Blackwater and Colne, Crouch and Roach)</b> Enhance saltmarsh regeneration, ensure compliance with Habitat Regulations</p> <p><b>North and South Essex Flood catchment management plans</b> Managing flood risk</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Abberton Reservoir SPA: Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA: Receptor</b>	<p>Changes to water quality and of water temperature can impact species composition for example. by encouraging excessive algal growth. This in turn can affect the composition of habitats and associated invertebrate assemblages and could result in an impact upon bird food sources.</p> <p>Thermal plumes associated with discharge of heated water could impact on invertebrates and also on migratory fish both of which are prey items for birds.</p> <p>Accidental release of pollutants entering the estuarine system which many birds of the SPA/Ramsar use may impact on favourable condition for example. toxins may bio-accumulate within plants/invertebrates which may have an impact on birds further along the food chain. Biocides used to clean cooling infrastructure may have similar impacts.</p> <p>There are possible indirect effects on birds of the SAC/Ramsar which use the habitats in the vicinity of the nominated site as a resource for feeding.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and roosting is maintained.</p> <p>Although the SPA/Ramsar site is approximately 8km away it is not possible to rule out LSE on important bird assemblages of the SPA through water quality pathways.</p>

Abberton Reservoir SPA: Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise.</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b> Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p> <p><b>Raising of Abberton Reservoir</b> Overall positive effect due to creation of wetland habitat</p>

Abberton Reservoir SPA: Operation (duration approx 60 years)	
Water Resources/Quality	
Risk from 'In Combination' Effects?	Yes
AA Required?	Yes

Abberton Reservoir SPA: Operation (duration approx 60 years)	
Habitats and Species (Loss and Fragmentation)	
Potential Impacts: Pathway	Changes to footprint of site through operation, for example, to accommodate waste storage, develop infrastructure Pathways leading to likely significant habitat loss during operation are also related to impacts on water quality/resources. See this section for further information.
Potential effects on the SPA: Receptor	Any loss of habitats outside the SPA/Ramsar site that are used by important bird assemblages could have an impact on the favourable condition of the SPA/Ramsar site itself.
Risk of Likely Significant Effect (LSE)?	There is uncertainty regarding LSE as a result of habitat loss outside the SPA/Ramsar (for example. due to habitat loss within the Mid-Essex SPA/Ramsar complex for example). This needs to be investigated further.
Potential Impacts - other Plans and Programmes	<b>Abberton Reservoir</b> Overall positive effect due to creation of wetland habitat
Risk from 'In Combination' Effects?	Yes
AA Required?	Yes

<b>Abberton Reservoir SPA: Operation (duration approx 60 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	Increased workforce on site could lead to increased human pressure and disturbance on important bird assemblages for example through increased recreation.
<b>Potential effects on the SPA: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of birds for which the SPA/Ramsars are designated if they use habitats in close proximity to the nominated site.</p> <p>Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution and if tall structures interrupt flight lines and migration routes.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>As the SPA/Ramsar site is 8km from the nominated site direct impacts due to noise/light/visual disturbance are not anticipated.</p> <p>There is uncertainty regarding LSE as a result of disturbance to birds when they are outside the SPA/Ramsar. This needs to be investigated further.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p>

Abberton Reservoir SPA: Operation (duration approx 60 years)	
Noise/ Light/ Visual Disturbance	
	<p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p> <p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p> <p><b>Decommissioning of Bradwell Reactor Site</b> Water quality, air quality, noise and disturbance</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

**Source: Decommissioning (duration approx 30 years)**

<b>Abberton Reservoir SPA: Decommissioning (duration approx 30 years)</b>	
<b>Water Resources/Quality</b>	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example, increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA: Receptor</b>	Any release of toxins/pollutants could impact on important bird assemblages of the SPA/Ramsar. Any birds feeding along the coastline where contaminants may be released may suffer through accumulation of toxins within the food chain.
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>A key requirement for the important bird populations present on site is that water quality, quantity and salinity necessary for favourable condition of plant and animal communities suitable for bird feeding, nesting and is maintained.</p> <p>Although the SPA /Ramsar is approximately 8km from the nominated site it is difficult to rule out the risk of LSE through water quality pathways.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local transport plan</b> Land take, emissions, surface water run-off, pollution</p> <p><b>Local Development Frameworks/Core Strategies (Maldon, Chelmsford, Thurrock, Colchester, Rochford, Tendring)</b></p>

Abberton Reservoir SPA: Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>Coastal squeeze, disturbance, recreation, water quality</p> <p><b>Eco-Towns Programme</b> Increased abstraction</p> <p><b>Combined Essex Catchment Abstraction Management Strategy</b> Assessing effects of abstraction licences</p> <p><b>River Basin Management Plan: Anglian River Basin District</b> Address pollution issues, secure sustainable uses of water, improve wildlife habitats</p> <p><b>North and South Essex Flood Catchment Management Plans</b> Maintain and improve water quality standards, protect and improve water resources</p> <p><b>Raising of Abberton Reservoir</b> Overall positive effect due to creation of wetland habitat</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Abberton Reservoir SPA: Decommissioning (duration approx 30 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities, for example to accommodate waste storage, develop infrastructure.
<b>Potential effects on the SPA: Receptor</b>	Any loss of habitats outside the SPA/Ramsar sites that are used by important bird assemblages could have an impact on the favourable condition of the SPA/Ramsar site itself.
<b>Risk of Likely Significant Effect (LSE)?</b>	Direct loss of habitat within the SPA/Ramsar is considered unlikely given its distance from the nominated site.  There is uncertainty regarding LSE as a result of habitat loss outside the SPA/Ramsar (for example. due to habitat loss within the Mid-Essex SPA/Ramsar complex for example). This needs to be investigated further.
<b>Potential Impacts - other Plans and Programmes</b>	<b>Abberton Reservoir</b> Overall positive effect due to creation of wetland habitat
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

<b>Abberton Reservoir SPA: Decommissioning (duration approx 30 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated deconstruction likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
<b>Potential effects on the SPA: Receptor</b>	<p>The main impacts of noise/light and visual disturbance on the SPA/Ramsar would most likely be disturbance of birds for which the SPA/Ramsars are designated if they use habitats in close proximity to the nominated site.</p> <p>Birds are disturbed by sudden movements and noise which can displace them from their feeding and roosting grounds. They can also be affected by light pollution and if tall structures interrupt flight lines and migration routes.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>As the SPA/Ramsar site is 8km from the nominated site direct impacts due to noise/light/visual disturbance are not anticipated.</p> <p>There is uncertainty regarding LSE as a result of disturbance outside the SPA/Ramsar (for example, due to habitat loss within the Mid-Essex SPA/Ramsar complex for example). This needs to be investigated further.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p><b>Essex County Council Minerals and Waste Development Framework</b> Water quality, habitat loss, emissions, noise</p> <p><b>Local Transport Plan</b> emissions, surface water noise, run-off, pollution</p> <p><b>Maldon Core Strategy</b> Recreation, marina proposals, development along Crouch Valley Branch line</p> <p><b>Chelmsford Core Strategy</b> Recreational pressure</p>

Abberton Reservoir SPA: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	<p><b>Thurrock Core Strategy</b> Recreational disturbance</p> <p><b>Rochford Local Development Framework</b> Potential increased recreational use</p> <p><b>Colchester Core Strategy</b> Increased recreational pressure</p> <p><b>Tendring LDF</b> Possible increased recreational pressure (in preparation)</p> <p><b>Renewable Energy for Essex</b> Disturbance impacts relating to birds</p>
<b>Risk from 'In Combination' Effects?</b>	Yes
<b>AA Required?</b>	Yes

## Outer Thames Estuary SPA

The Joint Nature Conservation Committee (JNCC), Natural England and the Countryside Council for Wales (CCW) are undertaking a formal consultation on 10 possible Special Areas of Conservation and two potential Special Protection Areas in English, Welsh and offshore waters around the UK. The Outer Thames Estuary SPA is one of these sites and has not yet been formally designated.

### Source: Construction (duration approx 5 years)

Outer Thames Estuary SPA: Construction (duration approx 5years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	<p>Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example, increased run-off and sedimentation, pollution incidents through water courses and cycles).</p> <p>There may be a requirement for cooling water culverts and a marine landing facility extending into the coastal zone. Potential works associated with construction of these, for example, dredging, tunnelling or burying, could impact on water quality.</p>
<b>Potential effects on the SPA: Receptor</b>	<p>Red-throated Divers have a high sensitivity to toxic contamination through non-synthetic compounds (for example, heavy metals and hydrocarbons) and a moderate sensitivity to the introduction of synthetic compounds (for example, PCBs).</p> <p>Direct mortality of Red-throated Divers can occur as a result of heavy oils reducing the waterproofing of the birds' feathers, causing them to lose body heat, become exhausted and eventually drown (especially if a spill were to</p>

Outer Thames Estuary SPA: Construction (duration approx 5years)	
Water Resources/Quality	
	<p>occur when the birds become flightless during their autumn moult in September and October). Indirect effects can also occur as a result of toxins / pollutants deteriorating populations of prey items, either through mortality, reduced palatability or through accumulation of toxins within the food chain.</p> <p>Red-throated Divers also have a moderate sensitivity to non-toxic contamination as a result of changes in nutrient and organic loading, as well as changes in thermal regimes, changes in turbidity and changes in salinity. All such sources of non-toxic contamination can effect species composition and species richness within coastal waters, resulting in a reduction of prey items for divers and, in the case of increased turbidity, reduced visibility of prey items.</p> <p>The relative vulnerability of Red-throated Divers as a result of the introduction of radionuclides has not been assessed due to data deficiencies.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	Any LSE would most likely be associated with release of pollutants/toxins, which could impact upon Red-throated Divers through accumulation in the food chain. Given the close proximity of the SPA, impacts associated with water quality as a result of construction activities cannot be ruled out at this stage.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Bradwell A</p> <p>Local Development Frameworks - water abstraction, increased effluent discharges as a result of housing / employment growth</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary, which could result</p>

<b>Outer Thames Estuary SPA: Construction (duration approx 5years)</b>	
<b>Water Resources/Quality</b>	
	in impacts to SPA: <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Shipping - including dredging of channels</li> <li>• Land-based sources of pollution</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

<b>Outer Thames Estuary SPA</b>	
<b>Air Quality</b>	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to the local level, for example, dust/ particulates.
<b>Potential effects on the SPA: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading, which could impact upon species composition and abundance of prey items of Red-throated Divers.
<b>Risk of Likely Significant Effect (LSE)?</b>	Air quality is not a specific identified vulnerability for the SPA, although given its proximity to the nominated site (within 1km) further investigation into the impacts of nutrient loading from airborne pollution should be undertaken.

Outer Thames Estuary SPA	
Air Quality	
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Bradwell A</p> <p>Local Development Frameworks - increases in airborne pollutants arising from housing/ economic development, infrastructure, increase in transport.</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary, which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Shipping - including dredging of channels</li> <li>• Land-based sources of pollution</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	<p>Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.</p>
<b>AA Required?</b>	<p>Yes</p>

**Outer Thames Estuary SPA: Construction (duration approx 5 years)**

<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	Potential impacts could arise during the construction of cooling water culverts, marine landing facility and infrastructure, upgraded coastal protection and any additional channel dredging operations that are required.
<b>Potential effects on the SPA: Receptor</b>	Physical loss of and damage to supporting habitat (shallow coastal waters and areas in the vicinity of sub-tidal sandbanks) is a key sensitivity of the SPA. This is due to the loss of foraging sites for Red-throated Divers and hence, is detrimental to the favourable condition of the SPA. The link between this species and benthic communities is not well understood, but it is thought that sandbanks may have a functional role (as nursery, spawning, feeding or in providing shelter) in supporting some of their prey species such as gadoids, sprat, herring and sand eel.
<b>Risk of Likely Significant Effect (LSE)?</b>	Direct loss of habitat within the SPA used by Red-throated Divers could result in significant effects. Other significant effects on supporting habitats could occur through indirect pathways, including changes to coastal sediment regimes as a result of coastal defences and construction of a marine landing facility.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Renewables</li> <li>• Cables</li> <li>• Fisheries</li> <li>• Shipping - including dredging of channels</li> <li>• Recreation</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.

<b>Outer Thames Estuary SPA: Construction (duration approx 5 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>AA Required?</b>	Yes

<b>Outer Thames Estuary SPA: Construction (duration approx 5 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	<p>The construction phase is anticipated to last for approximately 5 years. There is the potential for a significant increase in noise, light and visual changes during the construction period, for example through machinery noise, increased vehicular movements and increased personnel present on site.</p> <p>Noise impacts are particularly relevant for any activities occurring within the intertidal zone, such as the construction of the marine landing facility, cooling culverts and coastal protection upgrades.</p>
<b>Potential effects on the SPA: Receptor</b>	The main impacts of noise, light and visual disturbance on the SPA would most likely be disturbance of Red-throated Divers if they use habitats in close proximity to the nominated site. The species is known to be highly sensitive to noise disturbance during the winter, which can result in displacement from feeding grounds and can affect the birds' chances of survival.
<b>Risk of Likely Significant Effect (LSE)?</b>	The SPA is adjacent to the nominated site. One of the key requirements for Red-throated Divers is minimal disturbance. Any increased noise disturbance as a result of construction could therefore have a likely significant effect.
<b>Potential Impacts -</b>	Decommissioning of Bradwell A

<b>Outer Thames Estuary SPA: Construction (duration approx 5years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>other Plans and Programmes</b>	<p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Renewables</li> <li>• Cables</li> <li>• Fisheries</li> <li>• Shipping - including dredging of channels</li> <li>• Recreation</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

## Source: Operation (duration approx 60 years)

Outer Thames Estuary SPA : Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
<b>Potential effects on the SPA: Receptor</b>	<p>Non-toxic water contamination (for example, changes to temperature and nutrient loading) can impact upon species composition, for example, by encouraging excessive algal growth. This, in turn, can affect associated invertebrate/fish assemblages with resulting reductions to prey availability for Red-throated Divers' food. The sensitivity of the prey species of Red-throated Divers to non-toxic contamination is considered moderate.</p> <p>Accidental release of toxic pollutants may impact on the favourable condition of the SPA. For example, toxins may bio-accumulate within fish/invertebrates, which may have an impact on Red-throated Divers. Biocides used to clean cooling infrastructure may have similar impacts. There could also be an actual reduction in prey item abundance through displacement or direct mortality.</p> <p>Red-throated Divers are also directly sensitive to the accidental release of toxic pollutants. Oil on the feathers can lead to loss of insulation, reduced buoyancy and possible drowning. Dispersants used to disperse the oil may also be harmful to the species.</p> <p>The relative vulnerability of Red-throated Divers as a result of the introduction of radionuclides has not been assessed due to data deficiencies.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	Given the close proximity of the SPA to the nominated site, significant impacts associated with water quality as a result of operational activities cannot be ruled out at this stage.

Outer Thames Estuary SPA : Operation (duration approx 60 years)	
Water Resources/Quality	
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Bradwell A</p> <p>Local Development Frameworks - water abstraction, increased effluent discharges as a result of housing / employment growth)</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Shipping - including dredging of channels</li> <li>• Land-based sources of pollution</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

**Outer Thames Estuary SPA Operation (duration approx 60 years)**

<b>Air Quality</b>	
<b>Potential Impacts: Pathway</b>	<p>Potential local impacts from increased development/ traffic growth / shipping movements (nitrogen oxides, sulphur dioxide).</p> <p>Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions.</p>
<b>Potential effects on the SPA: Receptor</b>	<p>An increase in airborne pollutants can lead to nutrient loading and changes to water quality from aerial deposition. This could impact upon abundance and distribution of prey species (fish/invertebrate) of Red-throated Divers.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	<p>Air quality not a specific identified vulnerability for the SPA, although, given its proximity to the nominated site, further investigation into the impacts of nutrient loading from airborne pollution should be undertaken.</p>
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Bradwell A</p> <p>Local Development Frameworks - increases in airborne pollutants arising from housing/ economic development, infrastructure, increase in transport.</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Shipping - including dredging of channels</li> <li>• Land-based sources of pollution</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	<p>Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.</p>

Outer Thames Estuary SPA Operation (duration approx 60 years)	
Air Quality	
AA Required?	Yes

Outer Thames Estuary SPA: Operation (duration approx 60 years)	
Habitats and Species (Loss and Fragmentation)	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through operation, for example, to accommodate waste storage, develop infrastructure (in particular any development which extends into the coastal fringe). Cooling water discharge into the North Sea could also lead to loss / damage to benthic habitats as a result of scour at the outfall.
<b>Potential effects on the SPA: Receptor</b>	Physical loss of and damage to supporting habitat (shallow coastal waters and areas in the vicinity of sub-tidal sanbanks) is a key sensitivity of the SPA given the resulting impact to abundance and quality of prey items of Red-throated Divers.
<b>Risk of Likely Significant Effect (LSE)?</b>	Direct loss of habitat within the SPA used by Red-throated Divers could result in significant effects.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p>

<b>Outer Thames Estuary SPA: Operation (duration approx 60 years)</b>	
<b>Habitats and Species (Loss and Fragmentation)</b>	
	<ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Renewables</li> <li>• Cables</li> <li>• Fisheries</li> <li>• Shipping - including dredging of channels</li> <li>• Recreation</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

<b>Outer Thames Estuary SPA: Operation (duration approx 60 years)</b>	
<b>Noise/ Light/ Visual Disturbance</b>	
<b>Potential Impacts: Pathway</b>	Increased workforce on site could lead to increased human pressure and disturbance (for example through increased recreational activity), as well as any routine maintenance required on coastal defences / infrastructure. There may also be additional shipping movements within the SPA and any lighting used on the power station buildings could result in some light spill onto adjacent coastal waters.
<b>Potential effects on the SPA: Receptor</b>	The main impacts of noise, visual and light disturbance on the SPA would most likely be disturbance of Red-throated Divers if they use habitats in close proximity to the nominated site. The species is known to have a high

Outer Thames Estuary SPA: Operation (duration approx 60 years)	
Noise/ Light/ Visual Disturbance	
	sensitivity to non-physical disturbance during the winter, which can result in displacement from feeding grounds and interrupt flight lines, both of which can affect the birds' chances of survival.
<b>Risk of Likely Significant Effect (LSE)?</b>	The SPA is adjacent to the nominated site. One of the key requirements for Red-throated Divers is minimal disturbance. Any increased non-physical disturbance could therefore have a likely significant effect.
<b>Potential Impacts - other Plans and Programmes</b>	Decommissioning of Bradwell A  The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA: <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Renewables</li> <li>• Cables</li> <li>• Fisheries</li> <li>• Shipping - including dredging of channels</li> <li>• Recreation</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

**Source: Decommissioning (duration approx 30 years)**

Outer Thames Estuary SPA: Decommissioning (duration approx 30 years)	
Water Resources/Quality	
<b>Potential Impacts: Pathway</b>	Potential effects on water quality and drainage from earthworks/ excavations and infrastructure provision (for example, increased run-off and sedimentation, pollution incidents through water courses and cycles).
<b>Potential effects on the SPA: Receptor</b>	<p>Any release of toxins/pollutants could impact on Red-throated Divers (the interest feature of the SPA) either directly (for example, through mortality as a result of oiled feathers) or indirectly through effects on habitats and prey species. Food sources (including small fish populations) could deteriorate and birds feeding along the coastline where contaminants may be released may suffer through accumulation of toxins within the food chain.</p> <p>Increased nutrient input may also affect species composition and abundance within the SPA causing a reduction in prey availability.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	Any LSE would most likely be associated with release of pollutants/toxins, which could impact upon Red-throated Divers through accumulation in the food chain. Given the close proximity of the SPA to the nominated site, impacts associated with water quality as a result of decommissioning activities cannot be ruled out at this stage.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Bradwell A</p> <p>Local Development Frameworks - water abstraction, increased effluent discharges as a result of housing / employment growth</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Catchment Abstraction Management Strategies</li> <li>• Coastal Habitat Management Plans Frameworks</li> </ul>

Outer Thames Estuary SPA: Decommissioning (duration approx 30 years)	
Water Resources/Quality	
	<p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Shipping - including dredging of channels</li> <li>• Land-based sources of pollution</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

Outer Thames Estuary SPA	
Air Quality	
<b>Potential Impacts: Pathway</b>	Potential local impacts from increased development/ traffic growth and emissions arising from de-construction activity (including increased shipping). Likely to be restricted to a local level, for example dust/ particulates.
<b>Potential effects on the SPA: Receptor</b>	An increase in airborne pollutants can lead to nutrient loading, which could impact upon on species composition and abundance of prey items of Red-throated Divers.
<b>Risk of Likely</b>	Air quality is not a specific identified vulnerability for the SPA, although, given its proximity to the nominated site

Outer Thames Estuary SPA	
Air Quality	
<b>Significant Effect (LSE)?</b>	(within 1km), further investigation into the impacts of nutrient loading from airborne pollution should be undertaken.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Bradwell A</p> <p>Local Development Frameworks - increases in airborne pollutants arising from housing/ economic development, infrastructure, increase in transport.</p> <p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Shipping - including dredging of channels</li> <li>• Land-based sources of pollution</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the pSPA.
<b>AA Required?</b>	Yes

<b>Outer Thames Estuary SPA: Decommissioning (duration approx 30 years)</b>	
<b>Habitat (and Species) Loss and Fragmentation</b>	
<b>Potential Impacts: Pathway</b>	Changes to footprint of site through decommissioning activities, for example to accommodate waste storage, develop infrastructure (in particular, any development which extends into the coastal fringe).
<b>Potential effects on the SPA: Receptor</b>	Loss or fragmentation of any habitat (particularly sandbanks) within the SPA could reduce the availability of feeding habitat for Red-throated Divers and thus could be detrimental to the favourable condition of the SPA.
<b>Risk of Likely Significant Effect (LSE)?</b>	Direct loss of supporting habitat within the SPA used by Red-throated Divers could result in significant effects.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Of relevance to understanding environmental condition:</p> <ul style="list-style-type: none"> <li>• Coastal Habitat Management Plans Frameworks</li> </ul> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p> <ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Renewables</li> <li>• Cables</li> <li>• Fisheries</li> <li>• Shipping - including dredging of channels</li> <li>• Recreation</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.

Outer Thames Estuary SPA: Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
<b>AA Required?</b>	Yes

Outer Thames Estuary SPA: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
<b>Potential Impacts: Pathway</b>	Decommissioning activity and associated deconstruction are likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the nominated site. Increased workforce on site could lead to increased human pressure and disturbance (for example through increased recreational activity). There may also be additional shipping movements within the SPA to transport materials off-site.
<b>Potential effects on the SPA: Receptor</b>	<p>The main impacts of noise, light and visual disturbance on the SPA would most likely be disturbance of Red-throated Divers if they use habitats in close proximity to the nominated site.</p> <p>Red-throated Divers are sensitive to disturbance, which can displace them from their feeding and roosting grounds and interrupt flight paths.</p>
<b>Risk of Likely Significant Effect (LSE)?</b>	The SPA is adjacent to the nominated site. One of the key requirements for Red-throated Divers is minimal disturbance. Any increased noise disturbance as a result of decommissioning could therefore have a likely significant effect.
<b>Potential Impacts - other Plans and Programmes</b>	<p>Decommissioning of Sizewell A</p> <p>The following is a list of current and proposed economic activities in the Outer Thames Estuary which could result in impacts to SPA:</p>

Outer Thames Estuary SPA: Decommissioning (duration approx 30 years)	
Noise/ Light/ Visual Disturbance	
	<ul style="list-style-type: none"> <li>• Aggregate extraction</li> <li>• Oil and Gas</li> <li>• Renewables</li> <li>• Cables</li> <li>• Fisheries</li> <li>• Shipping - including dredging of channels</li> <li>• Recreation</li> </ul>
<b>Risk from 'In Combination' Effects?</b>	Considered likely but unknown at the current time, as no other plans or programmes are noted which address the SPA.
<b>AA Required?</b>	Yes

## Appendix 4: HRA/ Appropriate Assessment Proforma

### Essex Estuaries SAC

- Location: 010237E/514206N
- Size (ha): 46140.82
- Designation: SAC

Essex Estuaries SAC	
<b>Qualifying Features</b>	<p>Annex I habitats that are a primary reason for selection of this site</p> <p>1130 <a href="#">Estuaries</a></p> <p>1140 <a href="#">Mudflats and sandflats not covered by seawater at low tide</a></p> <p>1310 <a href="#">Salicornia and other annuals colonizing mud and sand</a></p> <p>1320 <a href="#">Spartina swards (<i>Spartinion maritimae</i>)</a></p> <p>1330 <a href="#">Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</a></p> <p>1420 <a href="#">Mediterranean and thermo-atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)</a></p> <p>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</p> <p>1110 <a href="#">Sandbanks which are slightly covered by sea water all the time</a></p>
<b>Conservation Objectives</b>	<p><b>Conservation objectives for Essex Estuaries SAC are as follows</b></p> <p><b>1130 Estuaries</b></p> <p>Subject to natural change, maintain the estuaries in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh communities</li> <li>• Intertidal mudflat and sandflat communities</li> <li>• Rock communities</li> </ul>

	Essex Estuaries SAC
	<ul style="list-style-type: none"> <li>• Subtidal mud communities</li> <li>• Subtidal muddy sand communities</li> <li>• Subtidal mixed sediment communities</li> </ul> <p><b>1140 Mudflats and sandflats not covered by seawater at low tide</b>            Subject to natural change, maintain the mudflats and sand flats not covered by seawater at low tide in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Mud communities</li> <li>• Muddy sand communities</li> <li>• Sand and gravel communities</li> </ul> <p><b>1310 <i>Salicornia</i> and other annuals colonizing mud and sand</b>            Subject to natural change, maintain <i>Salicornia</i> and other annuals colonising mud and sand in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Glasswort/annual sea-blite community</li> <li>• Sea aster community</li> </ul> <p><b>1320 <i>Spartina</i> swards</b>            Subject to natural change, maintain the <i>Spartina</i> swards (<i>Spartinion</i>) in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Small cordgrass community</li> <li>• Smooth cordgrass community</li> </ul> <p><b>1330 Atlantic salt meadows</b>            Subject to natural change, maintain the Atlantic salt meadows (<i>Glauco-Puccinellietalia</i>) in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Lowland/mid-marsh communities</li> <li>• Upper marsh communities</li> <li>• Upper marsh transitional communities</li> </ul>

Essex Estuaries SAC	
	<ul style="list-style-type: none"> <li>• Drift-line community</li> </ul> <p><b>1420 Mediterranean and thermo-atlantic halophilous scrubs (<i>Arthrocnemetalia fruticosae</i>)</b>                      Subject to natural change, maintain the Mediterranean and thermo-atlantic halophilous scrubs (<i>Arthrocnemetalia fruticosae</i>) in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Shrubby sea-blite community</li> <li>• Rock sea lavender/sea heath community</li> </ul> <p><b>1110 Sandbanks which are slightly covered by sea water all the time</b></p> <ul style="list-style-type: none"> <li>• Conservation objections tbc</li> </ul>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats (Estuaries, Saltmarsh and Intertidal mudflats and sandflats)</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b> <i>Details at Appendix 1</i>	The saltmarshes and mudflats are under threat from ‘coastal squeeze’ – man made sea defences prevent landward migration of these habitats in response to sea-level rise. These habitats are also vulnerable to plans or projects (onshore and offshore) which have impacts on sediment transport.
<b>Predicted Impacts</b>  <i>What are the issues arising from the plan and how might the site be affected?</i>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature and possible local abrasion of habitats from discharge</li> </ul>

Essex Estuaries SAC	
	<p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of saltmarsh communities, intertidal mudflats and sandflats from extension of site boundary to accommodate water cooling infrastructure, marine landing facility and upgraded coastal protection.</li> <li>• Fragmentation from encroachment onto surrounding habitats particularly during construction phases</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b>  <i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>There could also be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts through a Site Environmental Management Plan.<sup>18</sup></p> <p>In addition the following plans have the potential to contribute to ‘in-combination impacts’. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents (Maldon, Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>• River Basin Management Plan. Anglian River Basin District</li> </ul>

<sup>18</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

	Essex Estuaries SAC
	<ul style="list-style-type: none"> <li>• Eco-Towns programme North-East Elsenham</li> <li>• The Combined Essex Catchment Abstraction Management Strategy</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• North and South Essex Flood Catchment Management Plans.</li> <li>• Bradwell Wind Farm</li> <li>• Decommissioning of Bradwell Nuclear Power Station</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (under consultation)</li> <li>• Chelmsford Borough Core Strategy</li> <li>• Colchester Core Strategy</li> <li>• Tendring LDF (in preparation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Decommissioning of Bradwell</li> </ul>

Essex Estuaries SAC	
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>19</sup> indicates that, the ecological and chemical status of the estuarine environments near to the nominated site are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained</li> <li>• The assessments for the coastal water quality, downstream from the nominated site mirror those for the estuarine environment, with a prediction that the chemical quality of the water will decline.</li> <li>• The ecological status of the rivers around the nominated site is assessed to be of ‘moderate’ ecological quality – the chemical condition of these rivers is either ‘moderate’ or has yet to be assessed. Groundwater chemical quality around the nominated site is assessed by the EA as being ‘poor.’</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality of the Essex Estuaries has improved greatly in recent years although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination (particularly nutrients). Macroalgal proliferation has been highlighted as a particular problem within the Blackwater Estuary<sup>20</sup>, which is a part of the SAC and falls adjacent to the nominated site. Therefore whilst current water quality indicators show ecological and chemical levels around the nominated site to be moderate or higher, it is not possible (without further details such as information on discharge levels and quantity) to conclude that discharges, both radioactive and non-radioactive will not have an adverse effect on the Essex Estuaries SAC including those areas in the immediate vicinity of the nominated site and those that are further afield.</li> <li>• The catchment<sup>21</sup> which feeds the Essex Estuaries has been split into north and south Essex and then further into ‘Water Resource Management Units’ (WRMUs). The nearest to the nominated site is WRM1 in</li> </ul>

<sup>19</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>

UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e>

<sup>20</sup> Essex Estuaries European Marine Site. Marine Biological Association. Occasional publication No 17 (2006)

<sup>21</sup> The Combined Essex Catchment Abstraction Management Strategy (EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

	Essex Estuaries SAC
	<p>the north Essex catchment. Rivers within this unit (including the River Blackwater from which abstraction for the nominated site is proposed at the mouth) are over-abstracted, over-licenced or have no water available. The River Blackwater itself is over-abstracted. It may therefore be a requirement for any new developments at the nominated site to provide water supply strategies.</p> <ul style="list-style-type: none"> <li>• Other than a potential location<sup>22</sup> details regarding water abstraction are largely unknown. It is therefore not possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the SAC.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>23</sup> indicates that the Essex Estuary complex is changing progressively.<sup>24</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. Habitat around the nominated site (predominantly sand and gravel, mud and saltmarsh) has developed as a result of natural coastal squeeze, exacerbated to some extent by reclamation and flood embankments. A 600-700 ha loss of intertidal habitat is predicted over the next 50 years.</li> <li>• Other than potential locations the extent of loss of habitats within the SAC from the construction of cooling water infrastructure, upgraded costal protection and a marine landing facility is currently unknown and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects through habitat loss and coastal squeeze on the SAC including those areas of the designation in the immediate vicinity of the nominated site and those that are further afield.</li> </ul>

<sup>22</sup> Proposed Nuclear Development at Bradwell. Environmental Scoping Report. British Energy (2008)

<sup>23</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>24</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

Essex Estuaries SAC	
	<p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Information obtained from Maldon District Council<sup>25</sup> indicates that air quality in the Maldon District is generally good with no risk of air quality objectives being exceeded within the district. The Environment Act 1995 gives local authorities the responsibility to periodically review and assess local air quality and, where air quality objectives are unlikely to be achieved, to designate air quality management areas. To this end, Maldon District Council (MDC) has developed an action plan aimed at reducing air pollution and carries out monthly monitoring of nitrogen dioxide at nine sites within its district area; however, none are near (or deemed to be required near) Bradwell. According to the MDC website, other pollutants (for example particulate matter (PM10), carbon monoxide, lead, ozone, sulphur dioxide and volatile organic compounds including benzene and 1, 3-butadiene) are not currently significant in the district of Maldon.</li> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>• The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>26</sup></li> <li>• Information provided by the Air Pollution Information System (APIS)<sup>27</sup> indicates that air quality in the area is good with pollution levels for all key pollutants (sulphur dioxide, nitrogen dioxide etc) being low. For habitats within the SAC such as saltmarsh there is currently no exceedance of critical loads.</li> <li>• Air quality issues around the nominated site are considered to potentially be most significant during construction and decommissioning phases (for example through increased dust and vehicle emissions). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan (2006-2011).</li> <li>• Saltmarsh habitats are thought to act as significant sinks for pollution (including airborne pollution) and pollutants could lead to habitat degradation. In addition pollutants can be tied up in the saltmarsh system for relatively long periods of time however cyclical patterns of erosion and accretion may lead to the release and re-deposition of pollutants. Given the proximity of the SAC to the nominated site it is therefore not</li> </ul>

<sup>25</sup> Maldon District Council [http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air\\_quality\\_monitoring.htm](http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air_quality_monitoring.htm)

<sup>26</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

<sup>27</sup> Air Pollution Information System <http://www.apis.ac.uk/>

Essex Estuaries SAC	
	<p>possible to conclude without further information that impacts from air quality will not have an adverse impact on the SAC.</p>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts on the Essex Estuaries SAC through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts (for example soft engineering for any upgraded coastal protection or use of permeable material for the marine landing facility). Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Air quality impacts are assessed as being significant at this N2K site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>

	Essex Estuaries SAC
<b>Conclude no adverse effect on integrity?</b>	<ul style="list-style-type: none"><li>• It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Essex Estuaries SAC as a result of impacts to water, changes to water and air quality, and habitat loss/ fragmentation, caused in part by coastal squeeze.</li></ul>

## Dengie SPA (Mid-Essex Coast Phase 1)

- **Location:**005734E/514126N
- **Size (ha):** 3127.23 ha
- **Designation:** SPA

Dengie SPA (Mid-Essex Coast Phase 1)	
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <ul style="list-style-type: none"> <li>• <a href="#">Bar-tailed Godwit</a> <i>Limosa lapponica</i></li> <li>• <a href="#">Hen Harrier</a> <i>Circus cyaneus</i></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <ul style="list-style-type: none"> <li>• <a href="#">Grey Plover</a> <i>Pluvialis squatarola</i></li> <li>• <a href="#">Knot</a> <i>Calidris canutus</i></li> <li>• <a href="#">Dark Bellied Brent Goose</a> <i>Branta bernicla bernicla</i></li> </ul> <p>The Dengie SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders)</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 31,452 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<p>Subject to natural change, maintain habitats for the internationally important populations of regularly occurring migratory bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and Cobble Shores</li> </ul>

Dengie SPA (Mid-Essex Coast Phase 1)	
	<ul style="list-style-type: none"> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain habitats for the internationally important assemblage of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and Cobble Shores</li> <li>• Grassland/grazing marsh</li> </ul>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting</li> </ul> <p><b>To maintain site integrity of estuarine habitats:</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>The main threat to the site is erosion of intertidal habitats due to a combination of sea level rise and isostatic forces operating on the land mass of Great Britain. The situation is worsened with increasing winter storm events whilst the hard sea walls along this coastline are preventing the saltmarsh and intertidal areas from migrating</p>

Dengie SPA (Mid-Essex Coast Phase 1)	
	<p>inland. The situation is being addressed by alternative food defence techniques. The shoreline management plan for the Essex Coast which seeks to provide a blueprint for managing the coast sustainably is currently being revised.</p> <p>The Thames Fishery is coming under increased pressure from boats that previously fished the Wash for cockles. Controls over the fishery have been put in place by Kent and Essex Sea Fisheries Committee.</p> <p>In addition important bird assemblages that use the mud and sandflats for feeding and roosting are vulnerable to disturbance from human activities.</p> <p><b>Species-specific vulnerabilities</b><sup>28</sup> Internationally, Bar-Tailed Godwits are threatened by the degradation of foraging sites due to land reclamation, pollution, and human disturbance</p>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature and possible local abrasion of habitats from discharge</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of saltmarsh communities, intertidal mudflats and sandflats from extension of site boundary to accommodate water cooling infrastructure, marine landing facility and upgraded coastal protection.</li> <li>• Fragmentation from encroachment onto surrounding habitats particularly during construction phases</li> </ul>

<sup>28</sup> Information on birds obtained from Birdlife International , The British Trust for Ornithology and The RSPB websites.

Dengie SPA (Mid-Essex Coast Phase 1)	
	<p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (particularly on birds) relating primarily to construction and decommissioning activities, also relevant offsite.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>There could also be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts on through a Site Environmental Management Plan.<sup>29</sup></p> <p>In addition the following plans have the potential to contribute to 'in-combination impacts'. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents (Maldon, Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>• River Basin Management Plan. Anglian River Basin District</li> <li>• Eco-Towns programme North-East Elsenham</li> <li>• The Combined Essex Catchment Abstraction Management Strategy</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> </ul>

<sup>29</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

	Dengie SPA (Mid-Essex Coast Phase 1)
	<ul style="list-style-type: none"> <li>• North and South Essex Flood Catchment Management Plans.</li> <li>• Bradwell Wind Farm</li> <li>• Decommissioning of Bradwell Nuclear Power Station</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (under consultation)</li> <li>• Chelmsford Borough Core Strategy</li> <li>• Colchester Core Strategy</li> <li>• Tendring LDF (under preparation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Decommissioning of Bradwell</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents ( Maldon, Chelmsford, Rochford, Colchester, Thurrock and Tendring)</li> <li>• Essex Renewable Energy Strategy</li> </ul>

Dengie SPA (Mid-Essex Coast Phase 1)	
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>30</sup> indicates that, the ecological and chemical status of the estuarine environments near to the nominated site are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</li> <li>• The Dengie SPA is along open coast rather than within the estuarine habitat, however given its proximity to the nominated site it could still be influenced by any changes with regards to water quality and resources. The ecological status of the coastal waters surrounding the SPA is rated as ‘moderate and there is not expected to be any change by 2015, while the chemical status is currently ‘good’ is also expected to remain unchanged in 2015.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the nominated site to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges both radioactive and non-radioactive will not have an adverse effect on the SPA given its proximity to the nominated site.</li> <li>• The northern end of the Dengie SPA falls immediately adjacent to the mouth of the Blackwater River where abstraction of cooling water is proposed. It may therefore be a requirement for any new developments at the nominated site to provide water supply strategies that take into account impacts on the Dengie SPA. Other than a potential location<sup>31</sup> details regarding water abstraction are largely unknown. It is therefore not</li> </ul>

<sup>30</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

<sup>31</sup> Proposed Nuclear Development at Bradwell. Environmental Scoping Report. British Energy (2008)

	Dengie SPA (Mid-Essex Coast Phase 1)
	<p>possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the SPA.</p> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>32</sup> indicates that the Essex Estuary complex is changing progressively.<sup>33</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat.</li> <li>• The Dengie SPA occurs immediately adjacent to the nominated site. Habitat within the SPA at this location is predominantly sand and gravel, mud and saltmarsh. The site is vulnerable to the effects of erosion of intertidal habitats therefore loss of any of these habitats could have adverse impacts on key bird species of the SPA through loss of roosting and feeding grounds.</li> <li>• Other than potential locations, the extent of loss of habitats within the SPA from the construction of cooling water infrastructure, upgraded costal protection and a marine landing facility is currently unknown and its significance in the wider context cannot be assessed at this stage. It is possible that changes as a result of proposed development activities may act cumulatively or accelerate changes (as identified within the CHaMP) to habitats which support important bird assemblages. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse impacts on important birds of the SPA through habitat loss and coastal squeeze pathways.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The important bird assemblages of the Dengie SPA are particularly vulnerable to disturbance from close human proximity and the screening noted the potential for construction and decommissioning phases in particular to create disturbance events, particularly through noise but also through light pollution impacts.</li> <li>• Site information for the SSSI units underpinning the SPA indicates that currently over 62.77% of the habitats</li> </ul>

<sup>32</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>33</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

	Dengie SPA (Mid-Essex Coast Phase 1)
	<p>supporting the interest feature species are in favourable condition whilst 37.23% of habitats are in decline. Any loss of habitat through development of the nominated site could contribute further to decline in favourable condition and could affect the integrity of the SPA, for example through displacement of important birds.</p> <ul style="list-style-type: none"> <li>• As the nominated site lies directly adjacent to the SPA designation and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds or to conclude that there will be no significant effect.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>34</sup> (WeBS) Reports were consulted and revealed that one key interest species, Dark Bellied Brent Goose, is on medium alert due to population declines; however the decline has been attributed to a large scale problem rather than one at a local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the SPA.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• The Dengie SPA falls immediately adjacent to the nominated site and within the Maldon District. Information obtained from Maldon District Council<sup>35</sup> indicates that air quality in the Maldon District is generally good with no risk of air quality objectives being exceeded within the district. The Environment Act 1995 gives local authorities the responsibility to periodically review and assess local air quality and, where air quality objectives are unlikely to be achieved, to designate air quality management areas. To this end, Maldon District Council (MDC) has developed an action plan aimed at reducing air pollution and carries out monthly monitoring of nitrogen dioxide at nine sites within its district area; however, none are near (or deemed to be required near) Bradwell. According to the MDC website, other pollutants (for example particulate matter (PM10), carbon monoxide, lead, ozone, sulphur dioxide and volatile organic compounds including benzene and 1, 3-butadiene) are not currently significant in the district of Maldon.</li> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other</li> </ul>

<sup>34</sup> <http://www.bto.org/webs/alerts/>

<sup>35</sup> Maldon District Council [http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air\\_quality\\_monitoring.htm](http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air_quality_monitoring.htm)

Dengie SPA (Mid-Essex Coast Phase 1)	
	<p>regulated industries and the Agency does not consider them to be an environmental priority.</p> <ul style="list-style-type: none"> <li>• The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>36</sup></li> <li>• Information provided by the Air Pollution Information System (APIS)<sup>37</sup> indicates that air quality in the area is good with pollution levels for all key pollutants (sulphur dioxide, nitrogen dioxide etc) being low. For habitats within the SPA such as saltmarsh there is currently no exceedance of critical loads and no vulnerability has been identified for the bird species of the SPA.</li> <li>• Air quality issues around the nominated site are considered to potentially be most significant during construction and decommissioning phases (for example through increased dust and vehicle emissions). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan (2006-2011)</li> <li>•</li> <li>• Saltmarsh habitats are thought to act as significant sinks for pollution (including airborne pollution) and pollutants could lead to habitat degradation. In addition pollutants can be tied up in the saltmarsh system for relatively long periods of time however cyclical patterns of erosion and accretion may lead to the release and re-deposition of pollutants. Given the proximity of the SPA to the nominated site it is therefore not possible to conclude without further information that impacts from air quality will not have an adverse impact on the SPA and its important bird species.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul>

<sup>36</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

<sup>37</sup> Air Pollution Information System <http://www.apis.ac.uk/>

Dengie SPA (Mid-Essex Coast Phase 1)	
	<p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts on the SPA through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts (for example soft engineering for any upgraded coastal protection or use of permeable material for the marine landing facility). Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals.</li> <li>• In addition protection measures should be incorporated into water intake systems so as to avoid depleting important food sources for birds such as fish/invertebrates.</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>• Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Air quality impacts are assessed as being significant at this N2K site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>

	Dengie SPA (Mid-Essex Coast Phase 1)
<b>Conclude no adverse effect on integrity?</b>	It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Dengie SPA as a result of, changes to water quality, air quality, disturbance impacts, and habitat loss/ fragmentation, caused in part by coastal squeeze.

## Dengie Ramsar (Mid-Essex Coast Phase 1)

- **Location:**005734E/514126N
- **Size (ha):** 3127.23 ha
- **Designation:** Ramsar

Dengie Ramsar (Mid-Essex Coast Phase 1)	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• Qualifies by virtue of the extent and diversity of saltmarsh habitat present. Dengie and four other sites in the Mid-Essex Coast Ramsar site complex includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• Dengie supports a number of rare plant and animal species. The Dengie has 11 species of nationally scarce plants as well as an invertebrate fauna that includes Red Data Book species.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.</li> </ul> <p><b>Ramsar criterion 5</b></p> <ul style="list-style-type: none"> <li>• Assemblages of international importance: 43828 waterfowl (5 year peak mean 19098/99 – 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance.</b></p> <p>Qualifying species/populations - Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Dark Bellied Brent Goose</li> <li>• Grey Plover</li> <li>• Red Knot</li> </ul>

<b>Dengie Ramsar (Mid-Essex Coast Phase 1)</b>	
	<p>Species identified subsequent to designation for possible future consideration under criterion 6</p> <ul style="list-style-type: none"> <li>• Bar tailed godwit</li> </ul>
<b>Conservation Objectives</b>	<p>No information currently available on conservation objectives specifically relating to the Ramsar site however the Dengie Ramsar covers the same area as the Dengie SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.</p>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p>As for Dengie SPA</p>
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>As for Dengie SPA</p>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature and possible local abrasion of habitats from discharge</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of saltmarsh communities, intertidal mudflats and sandflats from extension of site boundary to accommodate water cooling infrastructure, marine landing facility and upgraded coastal protection.</li> <li>• Fragmentation from encroachment onto surrounding habitats particularly during construction phases</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul>

<b>Dengie Ramsar (Mid-Essex Coast Phase 1)</b>	
	<p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>Local level impacts (particularly on birds) relating primarily to construction and decommissioning activities, also relevant offsite.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	As for Dengie SPA
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Current Environment Agency data<sup>38</sup> indicates that, the ecological and chemical status of the estuarine environments near to the nominated site are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</li> <li>The Dengie Ramsar is along open coast rather than within the estuarine habitat, however given its proximity to the nominated site it could still be influenced by any changes with regards to water quality and resources. The ecological status of the coastal waters surrounding the Ramsar is rated as ‘moderate and there is not expected to be any change by 2015, the chemical status which is currently ‘good’ is also rated as not</li> </ul>

<sup>38</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

	<b>Dengie Ramsar (Mid-Essex Coast Phase 1)</b>
	<p>changing in 2015.</p> <ul style="list-style-type: none"> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the nominated site to be 'moderate' or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges both radioactive and non-radioactive will not have an adverse effect on the Ramsar given its proximity to the nominated site.</li> <li>• The catchment<sup>39</sup> has been split into North and South Essex and then further into 'Water Resource Management Units' (WRMU). The South Essex catchment is most relevant to the Dengie Ramsar. WRM1 within the South Essex catchment includes the Asheldham Brook which is associated with the Dengie Peninsula. There is currently no water available in this river however as abstraction associated with the nominated site will most likely be from the marine environment there is unlikely to be an impact on this river and the Ramsar via this pathway.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>40</sup> indicates that the Essex Estuary complex is changing progressively.<sup>41</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat.</li> <li>• The Dengie Ramsar occurs immediately adjacent to the nominated site. Habitat within the Ramsar at this</li> </ul>

<sup>39</sup> The Combined Essex Catchment Abstraction Management Strategy(EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

<sup>40</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>41</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

	<b>Dengie Ramsar (Mid-Essex Coast Phase 1)</b>
	<p>location is predominantly sand and gravel, mud and saltmarsh, the latter being one of the key reasons for designation. The site is vulnerable to the effects of erosion of intertidal habitats therefore loss of additional areas of habitat as a result of development of the nominated site could add to the problem. Impacts on key bird species of the Ramsar through loss of roosting and feeding grounds as well as impacts on important plants and invertebrates (as listed under the Ramsar designation) may occur.</p> <ul style="list-style-type: none"> <li>• Other than potential locations, the extent of loss of habitats within the Ramsar from the construction of cooling water infrastructure, upgraded costal protection and a marine landing facility is currently unknown and its significance in the wider context cannot be assessed at this stage. It is possible that changes as a result of proposed development activities may act cumulatively or accelerate changes (as identified within the CHaMP) to habitats which support important bird assemblages. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that there will not be adverse impacts on important birds of the Ramsar through habitat loss and coastal squeeze pathways.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The important bird assemblages of the Dengie Ramsar are particularly vulnerable to disturbance from close human proximity and the screening noted the potential for construction and decommissioning phases in particular to create disturbance events, particularly through noise but also through light pollution impacts.</li> <li>• Site information for the SSSI units underpinning the Ramsar indicates that currently over 62.77% of the habitats supporting the interest feature species are in favourable condition whilst 37.23% of habitats are in decline. Any loss of habitat through development of the nominated site could contribute further to decline in favourable condition and could affect the integrity of the Ramsar for example through displacement of important bird assemblages.</li> <li>• As, the nominated site lies directly adjacent to the Ramsar designation and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds or to conclude that there will be no significant effect.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>42</sup> (WeBS) Reports were consulted and revealed that one key interest species,</li> </ul>

<sup>42</sup> <http://www.bto.org/webs/alerts/>

	Dengie Ramsar (Mid-Essex Coast Phase 1)
	<p>Dark Bellied Brent Goose, is on medium alert due to population declines; however the decline has been attributed to a large scale problem rather than one at a local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the SPA.</p> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• The Dengie Ramsar falls immediately adjacent to the nominated site and within the Maldon District. Information obtained from Maldon District Council<sup>43</sup> indicates that air quality in the Maldon District is generally good with no risk of air quality objectives being exceeded within the district. The Environment Act 1995 gives local authorities the responsibility to periodically review and assess local air quality and, where air quality objectives are unlikely to be achieved, to designate air quality management areas. To this end, Maldon District Council (MDC) has developed an action plan aimed at reducing air pollution and carries out monthly monitoring of nitrogen dioxide at nine sites within its district area; however, none are near (or deemed to be required near) Bradwell. According to the MDC website, other pollutants (for example particulate matter (PM10), carbon monoxide, lead, ozone, sulphur dioxide and volatile organic compounds including benzene and 1, 3-butadiene) are not currently significant in the district of Maldon.</li> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>• The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>44</sup></li> <li>• Information provided by the Air Pollution Information System (APIS)<sup>45</sup> indicates that air quality in the area is good with pollution levels for all key pollutants (sulphur dioxide, nitrogen dioxide etc) being low. For habitats within the Ramsar such as saltmarsh there is currently no exceedance of critical loads and no vulnerability has been identified for the bird species of the Ramsar.</li> <li>• Air quality issues around the nominated site are considered to potentially be most significant during</li> </ul>

<sup>43</sup> Maldon District Council [http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air\\_quality\\_monitoring.htm](http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air_quality_monitoring.htm)

<sup>44</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

<sup>45</sup> Air Pollution Information System <http://www.apis.ac.uk/>

	<b>Dengie Ramsar (Mid-Essex Coast Phase 1)</b>
	<p>construction and decommissioning phases (for example through increased dust and vehicle emissions). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan (2006-2011).</p> <ul style="list-style-type: none"> <li>•</li> <li>• Saltmarsh habitats are thought to act as significant sinks for pollution (including airborne pollution) and pollutants could lead to habitat degradation. In addition pollutants can be tied up in the saltmarsh system for relatively long periods of time however cyclical patterns of erosion and accretion may lead to the release and re-deposition of pollutants. Given the proximity of the Ramsar to the nominated site it is therefore not possible to conclude without further information that impacts from air quality will not have an adverse impact on the Ramsar and its important bird, invertebrate and plant species.</li> </ul>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts on the SPA through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts (for example soft engineering for any upgraded coastal protection or use of permeable material for the marine landing facility). Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals</li> <li>• In addition protection measures should be incorporated into water intake systems so as to avoid depleting important food sources for birds such as fish/invertebrates</li> </ul>

Dengie Ramsar (Mid-Essex Coast Phase 1)	
	<p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Air quality impacts are assessed as being significant at this N2K site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Dengie Ramsar as a result of impacts to water, changes to water quality, air quality, disturbance impacts, and habitat loss/ fragmentation, caused in part by coastal squeeze.</p>

## Colne Estuary SPA (Mid-Essex Coast Phase 2)

- **Location:** 005736E/514857N
- **Size (ha):** 2701.43ha
- **Designation:** SPA

Colne Estuary SPA (Mid-Essex Coast Phase 2)	
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>During the breeding season the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Little Tern</a> <i>Sterna albifrons</i></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a> <i>Recurvirostra avocetta</i></li> <li>• <a href="#">Golden Plover</a> <i>Pluvialis apricaria</i></li> <li>• <a href="#">Hen Harrier</a> <i>Circus cynaeus</i></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Dark-Bellied Brent Goose</a> <i>Branta bernicla bernicla</i></li> <li>• <a href="#">Redshank</a> <i>Tringa totanus</i></li> </ul> <p>The Colne Estuary SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 38,548 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	Subject to natural change, maintain the habitats for the internationally important populations of the regularly

Colne Estuary SPA (Mid-Essex Coast Phase 2)	
	<p>occurring Annex 1 bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Sand and gravel shores</li> <li>• Shallow Coastal Waters</li> <li>• Grassland/Grazing Marsh</li> <li>• Intertidal mudflats and sandflats</li> </ul> <p>Subject to natural change, maintain the habitats for the internationally important populations of regularly occurring migratory bird species in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Grassland/grazing marsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> </ul> <p>Subject to natural change, maintain the habitats for the internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Shallow coastal waters</li> <li>• Grassland/grazing marsh</li> </ul>
<p><b>Key Environmental Conditions (factors that maintain site integrity)</b></p>	<p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting</li> </ul>

Colne Estuary SPA (Mid-Essex Coast Phase 2)	
	<p><b>To maintain site integrity of estuarine habitats:</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species</li> <li>• Avoid disturbance from noise and/or visual activities</li> </ul>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<p>The Colne Estuary encompasses a diversity of soft coastal habitats, dependent on natural coastal processes. The vulnerability of these habitats is linked to changes in the physical environment; the intertidal zone is threatened by coastal squeeze and changes to sediment budget, especially updrift of the site. Beach feeding has been undertaken to alleviate the sediment problem.</p> <p>The site is also vulnerable to recreational pressures which can lead to habitat damage (salt marsh and sand dunes) and to disturbance of feeding and roosting waterfowl.</p> <p>Low water levels are also of concern and low freshwater flows into the estuary may be affecting bird numbers and/or distribution.</p> <p><b>Species-specific vulnerabilities</b></p> <p>Little Terns are highly vulnerable to human disturbance which can lead to nest failure. They are also threatened by habitat destruction for example development/reclamation of coastal habitat and pesticide pollution.</p>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> </ul>

Colne Estuary SPA (Mid-Essex Coast Phase 2)	
<p><b>how might the site be affected?</b></p>	<ul style="list-style-type: none"> <li>• Radioactive discharges (accidental and routine)</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• No direct impacts on habitat loss/fragmentation due to distance of SPA from the nominated site (5km). Pathways to habitat loss are indirect through water resources/quality and coastal squeeze. Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• No direct impacts due to distance of SPA from the nominated site (5km). Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</li> </ul> <p><b>Air quality</b></p> <ul style="list-style-type: none"> <li>• No impacts on air quality of the SPA due to Site being approximately 5km away from the nominated site.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><b>What other plans and programmes could lead to in-combinations effects?</b></p>	<p>There could be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts on through a Site Environmental Management Plan.<sup>46</sup></p> <p>In addition the following plans have the potential to contribute to ‘in-combination impacts’. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> </ul>

<sup>46</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

	Colne Estuary SPA (Mid-Essex Coast Phase 2)
	<ul style="list-style-type: none"> <li>• Local Transport Plan</li> <li>• Local Development Documents (Maldon, Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>• River Basin Management Plan. Anglian River Basin District</li> <li>• Eco-Towns programme North-East Elsenham</li> <li>• The Combined Essex Catchment Abstraction Management Strategy</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• North and South Essex Flood Catchment Management Plans.</li> <li>• Bradwell Wind Farm</li> <li>• Decommissioning of Bradwell Nuclear Power Station</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (Under consultation)</li> <li>• Chelmsford Borough Core Strategy</li> <li>• Colchester Core Strategy</li> <li>• Tendring LDF (in preparation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents (Maldon, Chelmsford, Rochford, Colchester, Thurrock and Tendring)</li> </ul>

Colne Estuary SPA (Mid-Essex Coast Phase 2)	
	<ul style="list-style-type: none"> <li>• Essex Renewable Energy Strategy</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>47</sup> indicates that, the ecological and chemical status of the Colne Estuary SPA are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination particularly nutrients. Macroalgal proliferation is known to occur within the Colne Estuary<sup>48</sup></li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the SPA to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on the SPA. In addition not enough is known at the current time about the coastal processes such as exchange of water and drift patterns which could disperse contaminants from the nominated site into the Colne Estuary SPA.</li> <li>• The catchment<sup>49</sup> has been split into North and South Essex and then further into ‘Water Resource Management Units’ (WRMU). The North Essex catchment is most relevant to the Colne Estuary SPA. The rivers feeding into the estuary are all over-abstracted, over-licenced or no water is available (WRM1,</li> </ul>

<sup>47</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>

UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e>

<sup>48</sup> Essex Estuaries European Marine Site. Marine Biological Association. Occasional publication No 17 (2006)

<sup>49</sup> The Combined Essex Catchment Abstraction Management Strategy(EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

	Colne Estuary SPA (Mid-Essex Coast Phase 2)
	<p>WRM2, WRM3). The only exception is WRM4 which currently has water available.</p> <ul style="list-style-type: none"> <li>Abstraction associated with the nominated site will be taken from the Blackwater Estuary<sup>50</sup>. This estuarine system is directly linked with the Colne Estuary therefore any impacts of abstraction could have a knock on effect within the estuary which is already under considerable pressure from abstraction further up the catchment (for example low freshwater flows into the estuary are a current concern and may be affecting bird numbers and distribution). The possible implications of any abstraction for the Colne Estuary SPA are uncertain at the present time and need further investigation.</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>51</sup> indicates that the Essex Estuary complex is changing progressively.<sup>52</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. Within the Colne Estuary SPA potential loss of saltmarsh habitat is predicted to be 116ha over the next 50 years. This has potentially serious implications for important bird assemblages of the SPA.</li> <li>The Colne SPA is located 5km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are unlikely. Despite this there is not enough information to determine whether there will be indirect impact on the SPA which is already under threat from coastal squeeze and changes to the sediment budget. It is possible that any changes may act cumulatively or accelerate changes (as identified within the CHaMP) with possible knock on effects for important bird assemblages of the SPA. In order to determine if this is the case further information on coastal processes such as water and sediment regimes is required.</li> <li>At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse impacts on the integrity of the SPA through water quality and coastal squeeze</li> </ul>

<sup>50</sup> Proposed Nuclear Development at Bradwell. Environmental Scoping Report. British Energy (2008)

<sup>51</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>52</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

Colne Estuary SPA (Mid-Essex Coast Phase 2)	
	<p>impacts. There may also be impacts relating to disturbance and habitat loss however these are discussed separately in the context of the Mid-Essex Coast SPA/Ramsar as whole.</p> <ul style="list-style-type: none"> <li>Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>53</sup> (WeBS) Reports were consulted and revealed that one key species, Dark Bellied Brent Goose, is on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the SPA.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>Where proposals for design and build remain under development, the Nuclear NPS should seek to avoid impacts on the SPA through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts (for example soft engineering for the upgraded coastal protection).</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Colne Estuary SPA as a result of impacts to water and coastal squeeze.</p>

<sup>53</sup> <http://www.bto.org/webs/alerts/>

## Colne Estuary Ramsar (Mid-Essex Coast Phase 2)

- **Location:** 005736E/514857N
- **Size (ha):** 2701.43ha
- **Designation:** Ramsar

Colne Estuary Ramsar (Mid-Essex Coast Phase 2)	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• The site is important due to the extent and diversity of saltmarsh present. This site, and four other sites in the Mid-Essex Coast complex, includes a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• The site supports 12 species of nationally scarce plants and at least 38 British Red Data Book invertebrate species</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain</li> </ul> <p><b>Ramsar criterion 5</b></p> <ul style="list-style-type: none"> <li>• Assemblages of international importance - Species with peak counts in winter: 32041 waterfowl (5 year peak mean 1998/99 – 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance:</b>                      Species with peak counts in winter - Qualifying species/populations</p> <ul style="list-style-type: none"> <li>• Dark-bellied Brent Goose</li> <li>• Common Redshank</li> </ul> <p>Species/populations identified subsequent to designation for possible future consideration under criterion 6:</p>

Colne Estuary Ramsar (Mid-Essex Coast Phase 2)	
	<p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Black-tailed Godwit</li> </ul>
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Colne Estuary Ramsar covers the same area as the Colne Estuary SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	As for Colne Estuary SPA
<b>Vulnerabilities (includes existing pressures and trends)</b>	As for Colne Estuary SPA
<i>Details at Appendix 1</i>	
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• No direct impacts on habitat loss/fragmentation due to distance of the Ramsar from the nominated site (5km). Pathways to habitat loss are indirect through water resources/quality and coastal squeeze. Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p>

Colne Estuary Ramsar (Mid-Essex Coast Phase 2)	
	<ul style="list-style-type: none"> <li>No direct impacts due to distance of Ramsar from the nominated site (5km). Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</li> </ul> <p><b>Air quality</b></p> <ul style="list-style-type: none"> <li>No impacts on air quality of the Ramsar due to Site being approximately 5km away from the nominated site.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	As for Colne Estuary SPA
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<ul style="list-style-type: none"> <li>Current Environment Agency data<sup>54</sup> indicates that, the ecological and chemical status of the Colne Estuary Ramsar are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained</li> <li>Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination particularly nutrients. Macroalgal proliferation has been highlighted as being a problem in the Colne Estuary<sup>55</sup></li> <li>Therefore, whilst current water quality indicators show ecological and chemical levels around the Ramsar to</li> </ul>

<sup>54</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

<sup>55</sup> Essex Estuaries European Marine Site. Marine Biological Association. Occasional publication No 17 (2006)

	Colne Estuary Ramsar (Mid-Essex Coast Phase 2)
	<p>be 'moderate' or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on the Ramsar. In addition not enough is known at the current time about the coastal processes such as exchange of water and drift patterns which could disperse contaminants from the nominated site into the Colne Estuary.</p> <ul style="list-style-type: none"> <li>• The catchment<sup>56</sup> has been split into North and South Essex and then further into 'Water Resource Management Units' (WRMU). The North Essex catchment is most relevant to the Colne Estuary Ramsar. The rivers feeding into the estuary are all over-abstracted, over-licenced or no water is available (WRM1, WRM2, WRM3). The only exception is WRM4 which currently has water available.</li> <li>• Abstraction associated with the nominated site will be taken from the Blackwater Estuary<sup>57</sup>. This estuarine system is directly linked with the Colne Estuary therefore any impacts of abstraction could have a knock on effect within the estuary which is already under considerable pressure from abstraction further up the catchment. Low freshwater flows into the estuary are a current concern and may be affecting bird numbers and distribution. The possible implications of any abstraction for the Colne Estuary Ramsar are uncertain at the present time and need further investigation.</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>58</sup> indicates that the Essex Estuary complex is changing progressively.<sup>59</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. Within the Colne Estuary Ramsar potential loss of saltmarsh habitat (a key reason for designation of the site) is predicted to be 116ha over the next 50 years. This has potentially serious implications for important bird assemblages and also the nationally important plant and invertebrate species associated with the site.</li> </ul>

<sup>56</sup> The Combined Essex Catchment Abstraction Management Strategy (EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

<sup>57</sup> Proposed Nuclear Development at Bradwell. Environmental Scoping Report. British Energy (2008)

<sup>58</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>59</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

Colne Estuary Ramsar (Mid-Essex Coast Phase 2)	
	<ul style="list-style-type: none"> <li>• The Colne Ramsar is located 5km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are unlikely. Despite this there is not enough information to determine whether there will be indirect impact on the Ramsar which is already under threat from coastal squeeze and changes to the sediment budget. It is possible that any changes may act cumulatively or accelerate changes (as identified within the CHaMP) with possible knock on effects for important bird assemblages, plants and invertebrates of the Ramsar. In order to determine if this is the case further information on coastal processes such as water and sediment regimes is required.</li> <li>• At this strategic stage where detailed development plans are unknown, it is not possible to conclude that there will not be adverse impacts on the integrity of the Ramsar through water quality and coastal squeeze impacts. There may also be impacts relating to disturbance and habitat loss however these are discussed separately in the context of the Mid-Essex Coast SPA/Ramsar as whole.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>60</sup> (WeBS) Reports were consulted and revealed that one key species, Dark Bellied Brent Goose, is on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the Ramsar.</li> </ul>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendation for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to avoid impacts on the Ramsar through careful consideration of site layout and design and technologies/methods</li> </ul>

<sup>60</sup> <http://www.bto.org/webs/alerts/>

	<b>Colne Estuary Ramsar (Mid-Essex Coast Phase 2)</b>
	which could be used to minimise impacts (for example soft engineering for the upgraded coastal protection).
<b>Conclude no adverse effect on integrity?</b>	It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Colne Estuary Ramsar as a result of impacts to water and coastal squeeze.

## Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)

- **Location:** 004306E/513823N
- **Size (ha):** 1735.58
- **Designation:** SPA

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Dark-Bellied Brent Goose</a> <i>Branta bernicla bernicla</i></li> </ul> <p>The Crouch and Roach Estuaries SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• 18607 waterfowl (5 year peak mean 30/06/1999)</li> </ul>
<b>Conservation Objectives</b>	<p>Subject to natural change, maintain the habitats for internationally important populations of regularly occurring migratory bird species in favourable condition, in particular;</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain the habitats for the internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul>

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
<p><b>Key Environmental Conditions (factors that maintain site integrity)</b></p>	<p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting.</li> </ul> <p><b>To maintain site integrity of estuarine habitats;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities.</li> </ul>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<p><b>Site specific vulnerabilities:</b></p> <p>The site is vulnerable to coastal squeeze and changes to the sediment budget.</p> <ul style="list-style-type: none"> <li>• Disturbance of feeding and roosting waterfowl is an issue through recreational use of sea wall footpaths.</li> <li>• Habitats are vulnerable to run-off and seepage from adjacent farmland. Farmers encouraged in stewardship schemes to help solve this.</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> </ul>

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
<p><b><i>arising from the plan and how might the site be affected?</i></b></p>	<ul style="list-style-type: none"> <li>• Radioactive discharges (accidental and routine)</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p>Please note:</p> <p>There are no direct impacts on habitat loss/fragmentation due to distance of the SPA from the nominated site (13km approx). Pathways to habitat loss are indirect through water resources/quality/coastal squeeze. Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No direct impacts from disturbance due to distance of SPA from the nominated site (13km). Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No impacts on air quality of the SPA due to Site being approximately 13km away from the nominated site.</p>
<p><b>Potential In-combination effects (screening)</b></p> <p><b><i>What other plans and programmes could lead to in-combinations effects?</i></b></p>	<p>There could also be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts on through a Site Environmental Management Plan.<sup>61</sup></p> <p>In addition the following plans have the potential to contribute to ‘in-combination impacts’. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> </ul>

<sup>61</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
	<ul style="list-style-type: none"> <li>• Local Development Documents (Maldon, Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>• River Basin Management Plan. Anglian River Basin District</li> <li>• Eco-Towns programme North-East Elsenham</li> <li>• The Combined Essex Catchment Abstraction Management Strategy</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• North and South Essex Flood Catchment Management Plans.</li> <li>• Bradwell Wind Farm</li> <li>• Decommissioning of Bradwell Nuclear Power Station</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (under consultation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>62</sup> indicates that, the ecological and chemical status of the Crouch and Roach Estuaries are ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained. Groundwater status is mostly ‘poor (deteriorating)’ whilst ecological status of the rivers feeding the estuaries ranges are predominantly ‘moderate’.</li> </ul>

<sup>62</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e>

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
	<ul style="list-style-type: none"> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the SPA to be 'moderate' or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on the SPA. In addition not enough is known at the current time about the coastal processes such as exchange of water and drift patterns which could disperse contaminants from the nominated site southwards and into the SPA.</li> <li>• The catchment<sup>63</sup> has been split into North and South Essex and then further into 'Water Resource Management Units' (WRMU). The South Essex catchment is most relevant to the Crouch and Roach SPA. Rivers feeding the estuary system (WRM2) currently have water available for abstraction. However as abstraction associated with the nominated site will most likely be from the marine environment immediately adjacent there is unlikely to be an impact on this river and the SPA via this pathway.</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>64</sup> indicates that the Essex Estuaries complex is changing progressively.<sup>65</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. Within the Crouch and Roach Estuary SPA modelling predicts there could be loss of nearly all the existing</li> </ul>

<sup>63</sup> The Combined Essex Catchment Abstraction Management Strategy(EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

<sup>64</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>65</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
	<p>saltmarsh habitat over the next 50 years (a total of 321ha). This has potentially serious implications for important bird assemblages of the SPA.</p> <ul style="list-style-type: none"> <li>• The Crouch and Roach Estuaries are located approximately 13km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are unlikely. There is a currently a southerly drift of littoral sediment<sup>66</sup> along the Essex coast between the nominated site and the SPA, therefore re-suspended sediment from development could be carried towards the designation. It is likely that the majority of this sediment would be redistributed before reaching the SPA (for example along the Dengie SPA/Ramsar which falls between the two areas) and any quantities reaching the SPA are not likely to be at a level to cause significant impacts.</li> <li>• At this strategic stage where detailed development plans are unknown, it is not possible to conclude that there will not be adverse impacts on the integrity of the SPA through water quality pathways. There may also be impacts relating to disturbance and habitat loss however these are discussed separately in the context of the Mid-Essex Coast SPA/Ramsar as whole.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>67</sup> (WeBS) Reports were consulted and revealed that one key interest species, Dark Bellied Brent Goose, is on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the SPA.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul>

<sup>66</sup> EuroSION Case Study: Essex Estuaries <http://www.coastalguide.org/projects/index.html>

<sup>67</sup> <http://www.bto.org/webs/alerts/>

Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)	
<b>Conclude no adverse effect on integrity?</b>	It is not possible to conclude that that there will not be adverse impacts on the integrity of the SPA through water quality pathways due to the dynamic nature of estuarine systems and the fact that contaminants can be dispersed over large distances. Likely significant effects from coastal squeeze have been ruled out however due to distance between the nominated site and the SPA.

## Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)

- **Location:** 004306E/513823N
- **Size (ha):** 1735.58
- **Designation:** Ramsar

Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• Supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant and animal including 13 nationally scarce plant species. Several important invertebrate species are also present on the site.</li> </ul> <p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter – 16970 waterfowl (5 year peak mean 1998/99 – 200/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations - Species peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Dark-bellied Brent Goose</li> </ul>
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Crouch and Roach Ramsar covers the same area as the Crouch and Roach SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	As for Crouch and Roach SPA
<b>Vulnerabilities (includes</b>	As for Crouch and Roach SPA

Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)	
existing pressures and trends)	
<i>Details at Appendix 1</i>	
<b>Predicted Impacts</b>  <i>What are the issues arising from the plan and how might the site be affected?</i>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p>Please note:</p> <p>There are no direct impacts on habitat loss/fragmentation due to distance of the SPA from the nominated site (13km approx). Pathways to habitat loss are indirect through water resources/quality/coastal squeeze. Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No direct impacts from disturbance due to distance of SPA from the nominated site (13km). Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No impacts on air quality of the SPA due to Site being approximately 13km away from the nominated site.</p>
<b>Potential In-combination effects (screening)</b>  <i>What other plans and programmes could lead to in-combinations</i>	As for Crouch and Roach SPA

Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)	
<b>effects?</b>	
<b>Appropriate Assessment</b>	
<b>Likelihood of adverse effect on integrity:</b>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>68</sup> indicates that, the ecological and chemical status of the Crouch and Roach Estuaries are ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that the both the ecological and chemical status will be maintained. Groundwater status is mostly ‘poor (deteriorating)’ whilst ecological status of the rivers feeding the estuaries is predominantly ‘moderate’.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the Ramsar to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on the Ramsar. In addition not enough is known at the current time about the coastal processes such as exchange of water and drift patterns which could disperse contaminants from the nominated site southwards and into the Ramsar site.</li> <li>• The catchment<sup>69</sup> has been split into North and South Essex and then further into ‘Water Resource Management Units’ (WRMU). The South Essex catchment is most relevant to the Crouch and Roach Ramsar. Rivers feeding the estuary system (WRM2) currently have water available for abstraction. However as abstraction associated with the nominated site will most likely be from the marine environment immediately adjacent there is unlikely to be an impact on this river and the Ramsar via this pathway.</li> </ul>

<sup>68</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

<sup>69</sup> The Combined Essex Catchment Abstraction Management Strategy(EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)	
	<p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>70</sup> indicates that the Essex Estuary complex is changing progressively.<sup>71</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. Within the Crouch and Roach Estuary Ramsar modeling predicts there could be loss of nearly all the existing saltmarsh habitat over the next 50 years (a total of 321ha). This has potentially serious implications for important bird assemblages and nationally important plants and invertebrates of the designation.</li> <li>• The Crouch and Roach Estuaries are located approximately 13km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are unlikely. Given that the Crouch and Roach estuaries are sheltered and a considerable distance from the nominated site it is also considered that any knock on effects from upgraded coastal protection are unlikely. There is a currently a southerly drift of littoral sediment<sup>72</sup> along the Essex coast between the nominated site and the Ramsar, therefore sediment from development could be carried towards the designation. It is likely that the majority of this sediment would be redistributed before reaching the Ramsar (for example along the Dengie SPA/Ramsar which falls between the two areas) and any quantities reaching the Ramsar are not likely to be at a level to cause significant impacts</li> <li>• At this strategic stage where detailed development plans are unknown, it is not possible to conclude that there will not be adverse impacts on the integrity of the Ramsar through water quality pathways. There may also be impacts relating to disturbance and habitat loss however these are discussed separately in the context of the Mid-Essex Coast SPA/Ramsar as whole.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>73</sup> (WeBS) Reports were consulted and revealed that one key interest species,</li> </ul>

<sup>70</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>71</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

<sup>72</sup> Euroision Case Study: Essex Estuaries <http://www.coastalguide.org/projects/index.html>

<sup>73</sup> <http://www.bto.org/webs/alerts/>

<b>Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)</b>	
	<p>Dark Bellied Brent Goose, is on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the Ramsar.</p>
<b>Possible Avoidance and Mitigation Measures – <i>includes recommendations for policy/proposals</i></b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible to conclude that that there will not be adverse impacts on the integrity of the Ramsar through water quality pathways due to the dynamic nature of estuarine systems and the fact that contaminants can be dispersed over large distances. Likely significant effects from coastal squeeze have been ruled out however due to distance between the nominated site and the Ramsar.</p>

## Blackwater Estuary SPA (Mid-Essex Coast Phase 4)

- **Location:**005159E/514513N
- **Size (ha):** 4395.15ha
- **Designation:** SPA

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>During the breeding season the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Little Tern</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a></li> <li>• <a href="#">Golden Plover</a></li> <li>• <a href="#">Hen Harrier</a></li> <li>• <a href="#">Ruff</a></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>On passage:</p> <ul style="list-style-type: none"> <li>• <a href="#">Ringed Plover</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Black Tailed Godwit</a></li> <li>• <a href="#">Dark Bellied Brent Goose</a></li> <li>• <a href="#">Dunlin</a></li> <li>• <a href="#">Grey Plover</a></li> </ul>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<ul style="list-style-type: none"> <li>• <a href="#">Redshank</a></li> <li>• <a href="#">Ringed Plover</a></li> <li>• <a href="#">Shelduck</a></li> </ul> <p>The Blackwater Estuary SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 109,815 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<p>Subject to natural change, maintain habitats for the internationally important populations of the regularly occurring Annex I bird species in favourable condition, in particular;</p> <ul style="list-style-type: none"> <li>• Sand and gravel shores</li> <li>• Shallow coastal waters</li> <li>• Intertidal mudflats and sandflats</li> <li>• Grassland/grazing marsh</li> <li>• Saltmarsh</li> </ul> <p>Subject to natural change, maintain habitats for internationally important populations of the regularly occurring migratory bird species, in particular;</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain the habitats for internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> </ul>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<ul style="list-style-type: none"> <li>• Shallow coastal waters</li> <li>• Grassland/grazing marsh</li> </ul>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting</li> </ul> <p><b>To maintain site integrity of estuarine habitats;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species.</li> <li>• Avoid disturbance from noise and/or visual activities</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>	<ul style="list-style-type: none"> <li>• The main threat to the site is coastal erosion of intertidal habitats due to a combination of sea level rise and isostatic forces operating on the land mass of Great Britain. The situation is worsened by increasing winter storm events, whilst the hard sea walls along the coastline are preventing saltmarsh and intertidal areas from migrating inland.</li> <li>• Nutrient enrichment occurs from agricultural run-off and treated sewage effluent.</li> <li>• Water based recreation</li> <li>• Drought has lowered the water tables in grazing marshes.</li> </ul>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<p><b>Species-specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• Little Terns are highly vulnerable to human disturbance which can lead to nest failure. They are also threatened by habitat destruction for example development/reclamation of coastal habitat and pesticide pollution.</li> <li>• Dunlin - in winter this species is restricted to estuaries so is vulnerable to any changes in this habitat for example through land reclamation and the invasion of alien plant species (for example. <i>Spartina anglica</i> which has spread on British mudflats has resulted in a decrease in the size of feeding areas available). Also threatened by disturbance on intertidal mudflats from construction work and recreation.</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature and possible local abrasion of habitats from discharge</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of saltmarsh communities, intertidal mudflats and sandflats from extension of site boundary to accommodate water cooling infrastructure, marine landing facility and upgraded coastal protection.</li> <li>• Fragmentation from encroachment onto surrounding habitats particularly during construction phases</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (particularly on birds) relating primarily to construction and decommissioning activities,</li> </ul>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<p>also relevant offsite.</p> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>There could be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts on through a Site Environmental Management Plan.<sup>74</sup></p> <p>In addition the following plans have the potential to contribute to ‘in-combination impacts’. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>Essex County Council Minerals and Waste Development Framework</li> <li>Local Transport Plan</li> <li>Local Development Documents (Maldon, Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>River Basin Management Plan. Anglian River Basin District</li> <li>Eco-Towns programme North-East Elsenham</li> <li>The Combined Essex Catchment Abstraction Management Strategy</li> <li>Essex Estuaries Coastal Habitat Management Plan</li> <li>North and South Essex Flood Catchment Management Plans.</li> <li>Bradwell Wind Farm</li> <li>Decommissioning of Bradwell Nuclear Power Station</li> </ul>

<sup>74</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<p><b>Habitat (and species) Loss and Fragmentation/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (under consultation)</li> <li>• Chelmsford Borough Core Strategy</li> <li>• Colchester Core Strategy</li> <li>• Tendring LDF (under preparation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Decommissioning of Bradwell</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents ( Maldon, Chelmsford, Rochford, Colchester, Thurrock and Tendring)</li> <li>• Essex Renewable Energy Strategy</li> </ul>
<b>Appropriate Assessment</b>	<ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>75</sup> indicates that, the ecological and chemical status of the Blackwater Estuary SPA (which falls immediately adjacent to the nominated site) are assessed as ‘moderate’ and</li> </ul>

<sup>75</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
<b>Likelihood of adverse effect on integrity:</b>	<p>‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</p> <ul style="list-style-type: none"> <li>• The assessments for the coastal water quality, downstream from the nominated site mirror those for the estuarine environment, with a prediction that the chemical quality of the water, ‘good’, will be maintained to 2015.</li> <li>• The ecological status of the rivers which feed into the SPA is assessed to be of ‘poor’ to ‘moderate’ ecological quality – the chemical condition of these rivers is either ‘fail’ or has yet to be assessed. Groundwater chemical quality around SPA is assessed by the EA as being ‘poor, (deteriorating).’</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality around the SPA has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrient. Macroalgal proliferation has been highlighted as being a problem in the Blackwater Estuary<sup>76</sup></li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quality and quantity) to conclude that discharges both radioactive and non-radioactive will not have an adverse effect on the SPA and its important bird interests, especially due to the proximity of the designation to the proposed development.</li> <li>• The catchment<sup>77</sup> has been split into North and South Essex and then further into ‘Water Resource Management Units’ (WRMU). Within the North Essex catchment WRM1 is most relevant. Rivers within WRM1 include the River Blackwater which falls within the SPA and from which abstraction is proposed. This river is currently over-abstracted and additional abstraction may have a potential significant effect. It</li> </ul>

UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang= e>

<sup>76</sup> Essex Estuaries European Marine Site. Marine Biological Association. Occasional publication No 17 (2006)

<sup>77</sup> The Combined Essex Catchment Abstraction Management Strategy(EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

	Blackwater Estuary SPA (Mid-Essex Coast Phase 4)
	<p>may therefore be a requirement for any new developments at the nominated site to provide water supply strategies.</p> <ul style="list-style-type: none"> <li>• Other than a potential location details regarding water abstraction are largely unknown. It is therefore not possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the SPA.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management Plan (CHaMP) produced by the Environment Agency<sup>78</sup> indicates that the Essex Estuary complex is changing progressively.<sup>79</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. Habitat within Blackwater Estuary SPA (predominantly sand and gravel, mud and to a lesser extent saltmarsh) has developed as a result of natural coastal squeeze, exacerbated to some extent by reclamation and flood embankments. Modeling predicted a 600-700 ha loss of intertidal habitat over the next 50 years.</li> <li>• Other than potential locations the extent of loss of habitats within the SPA from the construction of cooling water infrastructure, upgraded costal protection and a marine landing facility is currently unknown and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features (and thus resulting in impacts on key bird species). At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects on the integrity of the SPA through habitat loss and coastal squeeze.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The important bird assemblages of the Blackwater SPA (for example Little Tern) are particularly vulnerable to disturbance from close human proximity and the screening noted the potential for</li> </ul>

<sup>78</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>79</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

	Blackwater Estuary SPA (Mid-Essex Coast Phase 4)
	<p>construction and decommissioning phases in particular to create disturbance events, particularly through noise but also through light pollution impacts.</p> <ul style="list-style-type: none"> <li>• Site information for the SSSI units underpinning the SPA indicates that currently only 47.16% of the habitats supporting the interest feature species are in favourable condition whilst 52.84% of habitats are in decline. Any loss of habitat through development of the nominated site could contribute further to decline in favourable condition and could affect the integrity of the SPA and its important bird species.</li> <li>• As, the nominated site lies directly adjacent to the SPA designation and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds or to conclude that there will be no significant effect.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>80</sup> (WeBS) Reports were consulted and revealed that, Dark Bellied Brent Goose, Shelduck, Grey Plover, Dunlin and Ruff are all on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the SPA.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• The Blackwater SPA falls immediately adjacent to the nominated site and within the Maldon District. Information obtained from Maldon District Council<sup>81</sup> indicates that air quality in the Maldon District is generally good with no risk of air quality objectives being exceeded within the district. The Environment Act 1995 gives local authorities the responsibility to periodically review and assess local air quality and, where air quality objectives are unlikely to be achieved, to designate air quality management areas. To this end, Maldon District Council (MDC) has developed an action plan aimed at reducing air pollution and carries out monthly monitoring of nitrogen dioxide at nine sites within its district area; however, none are near (or deemed to be required near) Bradwell. According to the MDC website, other pollutants (for example particulate matter (PM10), carbon monoxide, lead, ozone, sulphur dioxide and volatile organic</li> </ul>

<sup>80</sup> <http://www.bto.org/webs/alerts/>

<sup>81</sup> Maldon District Council [http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air\\_quality\\_monitoring.htm](http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air_quality_monitoring.htm)

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<p>compounds including benzene and 1, 3-butadiene) are not currently significant in the district of Maldon.</p> <ul style="list-style-type: none"> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>• The Agency’s most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>82</sup></li> <li>• Information provided by the Air Pollution Information System (APIS)<sup>83</sup> indicates that air quality in the area is good with pollution levels for all key pollutants (sulphur dioxide, nitrogen dioxide etc) being low. For habitats within the SPA such as saltmarsh there is currently no exceedance of critical loads and no vulnerability has been identified for the bird species of the SPA.</li> <li>• Air quality issues are considered to potentially be most significant during construction and decommissioning phases (for example through increased dust and vehicle emissions). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan (2006-2011).</li> <li>• In addition because of the special nature conservation (including the Blackwater SPA), landscape and heritage resources the Maldon District it is considered to be an area of planning restraint in terms of further housing development.</li> <li>• Saltmarsh habitats are thought to act as significant sinks for pollution (including airborne pollution) and pollutants could lead to habitat degradation. In addition pollutants can be tied up in the saltmarsh system for relatively long periods of time however cyclical patterns of erosion and accretion may lead to the release and re-deposition of pollutants. Given the proximity of the SPA to the nominated site it is therefore not possible to conclude without further information that impacts from air quality will not have an adverse impact on the SPA and its important bird species.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – includes</b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge</li> </ul>

<sup>82</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

<sup>83</sup> Air Pollution Information System <http://www.apis.ac.uk/>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
<b>recommendations for policy/proposals</b>	<p>regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</p> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts on the SPA through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts (for example soft engineering for any upgraded coastal protection or use of permeable material for the marine landing facility). Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals.</li> <li>• In addition protection measures should be incorporated into water intake systems so as to avoid depleting important food sources for birds such as fish/invertebrates</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>• Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>84</sup> (WeBS) Reports were consulted and revealed that one species, Dark Bellied Brent Goose, Shelduck, Grey Plover, Dunlin and Ruff are all on medium alert for this site due</li> </ul>

<sup>84</sup> <http://www.bto.org/webs/alerts/>

Blackwater Estuary SPA (Mid-Essex Coast Phase 4)	
	<p>to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the Ramsar.</p> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Air quality impacts are assessed as being significant at this N2K site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Blackwater SPA as a result of impacts to water, air quality, disturbance impacts, and habitat loss/ fragmentation, caused in part by coastal squeeze.</p>

## Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)

- **Location:**005159E/514513N
- **Size (ha):** 4395.15ha
- **Designation:** Ramsar

Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• The site qualifies by virtue of the extent and diversity of saltmarsh habitat present. This site and the four others in the Mid-Essex Coast complex, includes a total of 3,237 ha that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.</li> </ul> <p>•</p> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• The invertebrate fauna is well represented and includes at least 16 British Red Data Book species.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site supports a full and representative sequence of saltmarsh plant communities covering the range of variation in Britain.</li> </ul> <p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter- 105061 waterfowl (5 year peak mean 1998/99-2002/2003)</li> </ul> <p><b>Ramsar criterion 6</b></p> <p>Species/populations occurring at international levels of importance Qualifying species/populations – species with peak counts in winter</p>

Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)	
	<ul style="list-style-type: none"> <li>• Dark-bellied Brent Goose</li> <li>• Grey Plover</li> <li>• Dunlin</li> <li>• Black-tailed Godwit</li> </ul> <p>Species/populations identified subsequent to designation for possible future consideration under criterion 6</p> <p>Species with peak counts in winter</p> <ul style="list-style-type: none"> <li>• Common Shelduck</li> <li>• European Golden Plover</li> <li>• Common Redshank</li> </ul>
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Blackwater Estuary Ramsar covers the same area as the Blackwater Estuary SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	As for Blackwater Estuary SPA
<b>Vulnerabilities (includes existing pressures and trends)</b>	As for Blackwater Estuary SPA
<b>Predicted Impacts</b>  <i>What are the issues arising from the plan and how might the site be affected?</i>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature and possible local abrasion of habitats from discharge</li> </ul>

	<b>Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)</b>
	<p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Direct impacts, loss of saltmarsh communities, intertidal mudflats and sandflats from extension of site boundary to accommodate water cooling infrastructure, marine landing facility and upgraded coastal protection.</li> <li>• Fragmentation from encroachment onto surrounding habitats particularly during construction phases</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (particularly on birds) relating primarily to construction and decommissioning activities, also relevant offsite.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>As for Blackwater Estuary SPA</p>

Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)	
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>85</sup> indicates that, the ecological and chemical status of the Blackwater Estuary Ramsar (which falls immediately adjacent to the nominated site) are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that the both the ecological and chemical status will be maintained.</li>   <li>• The assessments for the coastal water quality, downstream from the nominated site mirror those for the estuarine environment, with a prediction that the chemical quality of the water, ‘good’, will be maintained to 2015..</li>   <li>• The ecological status of the rivers which feed into the Ramsar is assessed to be from ‘poor’ to ‘moderate’ ecological quality – the chemical condition of these rivers is either ‘fail’ or has yet to be assessed. Groundwater chemical quality around Ramsar is assessed by the EA as being ‘poor (deteriorating).’</li>   <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li>   <li>• Environmental condition data from the EA indicates that water quality around the Ramsar has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrient. Macroalgal proliferation has been highlighted as being a problem in the Blackwater Estuary<sup>86</sup> Therefore, whilst current water quality indicators show ecological and chemical levels to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quality and quantity) to conclude that discharges both radioactive and non-radioactive will not have an</li> </ul>

<sup>85</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

<sup>86</sup> Essex Estuaries European Marine Site. Marine Biological Association. Occasional publication No 17 (2006)

	<b>Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)</b>
	<p>adverse effect on the Ramsar and its important bird interests, especially due to the proximity of the designation to the proposed development.</p> <ul style="list-style-type: none"> <li>• The catchment<sup>87</sup> has been split into North and South Essex and then further into 'Water Resource Management Units' (WRMU). Within the North Essex catchment WRM1 is most relevant. Rivers within WRM1 include the River Blackwater which falls within the Ramsar and from which abstraction is proposed. This river is currently over-abstracted and additional abstraction may have a potential significant effect. It may therefore be a requirement for any new developments at the nominated site to provide water supply strategies.</li> <li>• Other than a potential location<sup>88</sup> details regarding water abstraction are largely unknown. It is therefore not possible to conclude that water supply to the development will avoid levels of abstraction that lead to adverse effects on the Ramsar.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>89</sup> indicates that the Essex Estuary complex is changing progressively.<sup>90</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat (one of the key interests of the designation). Habitat within Blackwater Estuary Ramsar (predominantly sand and gravel, mud and to a lesser extent saltmarsh) has developed as a result of natural coastal squeeze, exacerbated to some extent by reclamation and flood embankments. Modeling predicted a 600-700 ha loss of intertidal habitat over the next 50 years.</li> </ul>

<sup>87</sup> The Combined Essex Catchment Abstraction Management Strategy(EA 2007) <http://www.environment-agency.gov.uk/research/planning/33570.aspx>

<sup>88</sup> Proposed Nuclear Development at Bradwell. Environmental Scoping Report. British Energy (2008)

<sup>89</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>90</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

	Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)
	<ul style="list-style-type: none"> <li>• Other than potential locations the extent of loss of habitats within the Ramsar from the construction of cooling water infrastructure, upgraded costal protection and a marine landing facility is currently unknown and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP in relation the primary designation features (and thus resulting in impacts on key bird species/nationally important invertebrates). At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects on the integrity of the Ramsar through habitat loss and coastal squeeze.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The important bird assemblages of the Blackwater Ramsar are particularly vulnerable to disturbance from close human proximity and the screening noted the potential for construction and decommissioning phases in particular to create disturbance events, particularly through noise but also through light pollution impacts.</li> <li>• Site information for the SSSI units underpinning the Ramsar indicates that currently only 47.16% of the habitats supporting the interest feature species are in favourable condition whilst 52.84% of habitats are in decline. Any loss of habitat through development of the nominated site could contribute further to decline in favourable condition and could affect the integrity of the Ramsar.</li> <li>• As, the nominated site lies directly adjacent to the Ramsar designation and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds or to conclude that there will be no significant effect.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>91</sup> (WeBS) Reports were consulted and revealed that, Dark Bellied Brent Goose, Shelduck, Grey Plover, Dunlin and Ruff are all on medium alert due to population declines, however it is</li> </ul>

<sup>91</sup> <http://www.bto.org/webs/alerts/>

	Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)
	<p>unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the Ramsar.</p> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• The Blackwater Ramsar falls immediately adjacent to the nominated site and within the Maldon District. Information obtained from Maldon District Council<sup>92</sup> indicates that air quality in the Maldon District is generally good with no risk of air quality objectives being exceeded within the district. The Environment Act 1995 gives local authorities the responsibility to periodically review and assess local air quality and, where air quality objectives are unlikely to be achieved, to designate air quality management areas. To this end, Maldon District Council (MDC) has developed an action plan aimed at reducing air pollution and carries out monthly monitoring of nitrogen dioxide at nine sites within its district area; however, none are near (or deemed to be required near) Bradwell. According to the MDC website, other pollutants (for example particulate matter (PM10), carbon monoxide, lead, ozone, sulphur dioxide and volatile organic compounds including benzene and 1, 3-butadiene) are not currently significant in the district of Maldon.</li> <li>• The Environment Agency assesses that, non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority.</li> <li>• The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>93</sup></li> <li>• Information provided by the Air Pollution Information System (APIS)<sup>94</sup> indicates that air quality in the area is good with pollution levels for all key pollutants (sulphur dioxide, nitrogen dioxide etc) being low. For habitats within the Ramsar such as saltmarsh there is currently no exceedance of critical loads and no vulnerability</li> </ul>

<sup>92</sup> Maldon District Council [http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air\\_quality\\_monitoring.htm](http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air_quality_monitoring.htm)

<sup>93</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

<sup>94</sup> Air Pollution Information System <http://www.apis.ac.uk/>

Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)	
	<p>has been identified for the bird species of the Ramsar.</p> <ul style="list-style-type: none"> <li>• Air quality issues are considered to potentially be most significant during construction and decommissioning phases (for example through increased dust and vehicle emissions). The potential for cumulative effects from other plans and programmes is minimised by sustainable transport measures set out in the Local Transport Plan (2006-2011).</li> <li>• Saltmarsh habitats are thought to act as significant sinks for pollution (including airborne pollution) and pollutants could lead to habitat degradation. In addition pollutants can be tied up in the saltmarsh system for relatively long periods of time however cyclical patterns of erosion and accretion may lead to the release and re-deposition of pollutants. Given the proximity of the Ramsar to the nominated site it is therefore not possible to conclude without further information that impacts from air quality will not have an adverse impact on the Ramsar and its important bird, invertebrate and plant species</li> </ul>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts on the Ramsar through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts (for example soft engineering for any upgraded coastal protection or use of permeable material for the marine landing facility) . Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development</li> </ul>

Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)	
	<p>proposals</p> <ul style="list-style-type: none"> <li>• In addition protection measures should be incorporated into water intake systems so as to avoid depleting important food sources for birds such as fish/invertebrates</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>• Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Air quality impacts are assessed as being significant at this N2K site, it is appropriate that Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans including for example: the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible at this stage of the development of the Nuclear NPS to say that proposals at the nominated site will not have significant adverse effects on the Blackwater Ramsar as a result of impacts to water, air quality, disturbance impacts, and habitat loss/ fragmentation, caused in part by coastal squeeze.</p>

## Foulness SPA (Mid-Essex Coast Phase 5)

- Location: 005517E/513426N
- Size (ha): 10968.9
- Designation: SPA

Foulness SPA (Mid-Essex Coast Phase 5)	
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>During the breeding season the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a></li> <li>• <a href="#">Common Tern</a></li> <li>• <a href="#">Little Tern</a></li> <li>• <a href="#">Sandwich Tern</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Avocet</a></li> <li>• <a href="#">Bar-tailed Godwit</a></li> <li>• <a href="#">Golden Plover</a></li> <li>• <a href="#">Hen Harrier</a></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>On passage:</p> <ul style="list-style-type: none"> <li>• <a href="#">Redshank</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Dark Bellied Brent Goose</a></li> </ul>

	Foulness SPA (Mid-Essex Coast Phase 5)
	<ul style="list-style-type: none"> <li>• <a href="#">Grey Plover</a></li> <li>• <a href="#">Knot</a></li> <li>• <a href="#">Oystercatcher</a></li> </ul> <p>The Foulness SPA also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 107,468 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<p>Subject to natural change, maintain habitats for the internationally important populations of the regularly occurring Annex I bird species in favourable condition, in particular;</p> <ul style="list-style-type: none"> <li>• Shell, sand and gravel shores</li> <li>• Shallow coastal waters</li> <li>• Intertidal mudflats and sandflats</li> <li>• Saltmarsh</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain habitats for internationally important populations of the regularly occurring migratory bird species, in particular;</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> <li>• Grassland/grazing marsh</li> </ul> <p>Subject to natural change, maintain the habitats for internationally important assemblages of waterfowl in favourable condition, in particular:</p> <ul style="list-style-type: none"> <li>• Saltmarsh</li> <li>• Intertidal mudflats and sandflats</li> <li>• Boulder and cobble shores</li> </ul>

Foulness SPA (Mid-Essex Coast Phase 5)	
	<ul style="list-style-type: none"> <li>• Shallow coastal waters</li> <li>• Grassland/grazing marsh</li> </ul>
<p><b>Key Environmental Conditions (factors that maintain site integrity)</b></p>	<p><b>The important bird populations require habitats suitable for feeding, roosting and nesting to be maintained. The most important factors related to this are:</b></p> <ul style="list-style-type: none"> <li>• Current extent and distribution of suitable feeding, roosting and nesting habitats</li> <li>• Sufficient prey availability</li> <li>• Minimal levels of disturbance</li> <li>• Water quality, quantity and salinity necessary to maintain plant and animal communities suitable for bird feeding, nesting and roosting.</li> </ul> <p><b>To maintain site integrity of estuarine habitats;</b></p> <ul style="list-style-type: none"> <li>• Prevent physical loss/smothering of key habitats</li> <li>• Avoid physical damage resulting from abrasion/siltation</li> <li>• Avoid increased synthetic and or non/synthetic toxic contamination</li> <li>• Avoid organic enrichment/uncharacteristic changes in turbidity levels</li> <li>• Avoid biological disturbance through selective extraction of species/introduction of microbial pathogens/non-native species</li> <li>• Avoid disturbance from noise and/or visual activities</li> </ul>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<ul style="list-style-type: none"> <li>• Much of the area is owned by the ministry of defence and is not therefore subject to development pressures or public disturbance.</li> <li>• Offshore dredging may have impacts</li> <li>• Natural processes are causing erosion of saltmarsh</li> <li>• The site includes areas of grazing marsh and ditches. A combination of lower rainfall and improved drainage to facilitate arable production means that grazing marshes are becoming too dry.</li> <li>• The Essex Sea Fisheries committee control the cockle fishery through regulatory orders (The cockle beds present support internationally important numbers of wading birds)</li> </ul>

Foulness SPA (Mid-Essex Coast Phase 5)	
	<p><b>Species-specific vulnerabilities</b></p> <ul style="list-style-type: none"> <li>• The Sandwich Tern is particularly vulnerable to human disturbance (for example from tourists) especially near breeding colonies on beaches early in the breeding season. It is also sensitive to disturbance from coastal wind farms (wind turbines). It is threatened by the loss or degradation of its favoured breeding habitats through inundation, wind-blown sand and erosion, and has suffered previous local declines from to exposure to bio-accumulated organochlorine pollutants in marine fish.</li> <li>• During the breeding season the Common Tern is vulnerable to human disturbance at nesting colonies (for example from off-road vehicles, recreation, motor-boats, personal watercraft and dogs) and to the flooding of nest sites as a result of naturally fluctuating water levels. On its breeding grounds the species is also threatened by habitat loss as a result of coastal development, erosion, vegetation overgrowth (rapid vegetation succession encroaching upon nesting habitats) and chemical pollution (which may also result in eggshell thinning) it suffers predation at nesting colonies from rats (especially on islands) and from expanding populations of large gull species such as Herring Gulls <i>Larus argentatus</i> (gulls may also prevent the species from nesting in the area by colonising it first)</li> <li>• Little Terns are highly vulnerable to human disturbance which can lead to nest failure. They are also threatened by habitat destruction for example development/reclamation of coastal habitat and pesticide pollution.</li> <li>• Bar-Tailed Godwits are threatened by the degradation of foraging sites due to land reclamation, pollution, and human disturbance</li> </ul>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul>

Foulness SPA (Mid-Essex Coast Phase 5)	
	<p>Please note:</p> <p>No direct impacts on habitat loss/fragmentation due to distance of the SPA from the nominated site (12.5km approx). Pathways to habitat loss are indirect through water resources/quality and coastal squeeze. Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No direct impacts from disturbance due to distance of SPA from the nominated site (12.5km). Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No impacts on air quality of the SPA due to Site being approximately 12.5km away from the nominated site.</p>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>There could also be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts on through a Site Environmental Management Plan.<sup>95</sup></p> <p>In addition the following plans have the potential to contribute to ‘in-combination impacts’. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents (Maldon, Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>• River Basin Management Plan. Anglian River Basin District</li> <li>• Eco-Towns programme North-East Elsenham</li> <li>• The Combined Essex Catchment Abstraction Management Strategy</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• North and South Essex Flood Catchment Management Plans.</li> </ul>

<sup>95</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

Foulness SPA (Mid-Essex Coast Phase 5)	
	<ul style="list-style-type: none"> <li>• Bradwell Wind Farm</li> <li>• Decommissioning of Bradwell Nuclear Power Station</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (under consultation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>96</sup> indicates that, the ecological and chemical status of the estuarine and coastal waters surrounding Foulness SPA are ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained. Groundwater status is ‘poor (deteriorating)’.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality of the coastline has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the SPA to be</li> </ul>

<sup>96</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e>

	Foulness SPA (Mid-Essex Coast Phase 5)
	<p>'moderate' or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on the SPA. In addition not enough is known at the current time about the coastal processes such as exchange of water and drift patterns which could disperse contaminants from the nominated site southwards and into the remit of the SPA.</p> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>97</sup> indicates that the Essex Estuary complex is changing progressively.<sup>98</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. This has potentially serious implications for important bird assemblages of the SPA.</li> <li>• The Foulness SPA is located approximately 12.5km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are unlikely.. There is a currently a southerly drift of littoral sediment<sup>99</sup> along the Essex coast between the nominated site and the SPA, therefore re-suspended sediment from development could be carried towards the designation. It is likely that the majority of this sediment would be redistributed before reaching the SPA (for example along the Dengie SPA/Ramsar which falls between the two areas) and any quantities reaching the SPA are not likely to be at a level to cause significant impacts.</li> <li>• At this strategic stage where detailed development plans are unknown, it is not possible to conclude that there will not be adverse impacts on the integrity of the SPA through water quality pathways. There may also be impacts relating to disturbance and habitat loss however these are discussed separately in the</li> </ul>

<sup>97</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>98</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

<sup>99</sup> Euroasion Case Study: Essex Estuaries <http://www.coastalguide.org/projects/index.html>

Foulness SPA (Mid-Essex Coast Phase 5)	
	<p>context of the Mid-Essex Coast SPA/Ramsar as whole.</p> <ul style="list-style-type: none"> <li>Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>100</sup> (WeBS) Reports were consulted and revealed that two key interest species, Dark Bellied Brent and Grey Plover are on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the SPA.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – <i>includes recommendations for policy/proposals</i></b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible to conclude that that there will not be adverse impacts on the integrity of the SPA through water quality pathways due to the dynamic nature of estuarine systems and the fact that contaminants can be dispersed over large distances.</p>

<sup>100</sup> <http://www.bto.org/webs/alerts/>

## Foulness Ramsar (Mid-Essex Coast Phase 5)

- **Location:** 005517E/513426N
- **Size (ha):** 10968.9
- **Designation:** Ramsar

Foulness Ramsar (Mid-Essex Coast Phase 5)	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 1</b></p> <ul style="list-style-type: none"> <li>• This site qualifies by virtue of the extent and diversity of saltmarsh habitat present. This and four other sites in the Mid-Essex Coast Ramsar site complex, include a total of 3,237 ha, that represent 70% of the saltmarsh habitat in Essex and 7% of the total area of saltmarsh in Britain.</li> </ul> <p><b>Ramsar criterion 2</b></p> <ul style="list-style-type: none"> <li>• The site supports a number of nationally-rare and nationally scarce plant species and British Red Data Book invertebrates.</li> </ul> <p><b>Ramsar criterion 3</b></p> <ul style="list-style-type: none"> <li>• The site contains extensive saltmarsh habitat, with areas supporting full and representative sequences of saltmarsh plant communities covering the range of variation in Britain.</li> </ul> <p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter: 82148 waterfowl (5 year peak mean 1998/99- 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations Species with peak counts in spring/autumn</p> <ul style="list-style-type: none"> <li>• Common Redshank</li> </ul>

Foulness Ramsar (Mid-Essex Coast Phase 5)	
	<ul style="list-style-type: none"> <li>• Eurasian Oystercatcher</li> <li>• Grey Plover</li> <li>• Red Knot</li> <li>• Wintering</li> <li>• Bar-tailed Godwit</li> </ul>
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the Foulness Ramsar covers the same area as the Foulness SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	See Foulness SPA
<b>Vulnerabilities (includes existing pressures and trends)</b> <i>Details at Appendix 1</i>	See Foulness SPA
<b>Predicted Impacts</b>  <i>What are the issues arising from the plan and how might the site be affected?</i>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation</li> <li>• Potential for toxic contamination from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> </ul> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Reduction of coastal margin by movement of fixed landward boundary into designated space</li> </ul> <p>Please note:</p> <p>No direct impacts on habitat loss/fragmentation due to distance of the SPA from the nominated site (12.5km)</p>

Foulness Ramsar (Mid-Essex Coast Phase 5)	
	<p>approx). Pathways to habitat loss are indirect through water resources/quality and coastal squeeze. Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No direct impacts from disturbance due to distance of SPA from the nominated site (12.5km). Indirect effects on birds are discussed in the wider context of the Mid-Essex Coast SPA/Ramsar complex as a whole.</p> <p>No impacts on air quality of the SPA due to Site being approximately 12.5km away from the nominated site.</p>
<p><b>Potential In-combination effects (screening)</b> <i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>As for Foulness SPA</p>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>101</sup> indicates that, the ecological and chemical status of the estuarine and coastal waters surrounding Foulness Ramsar are ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained. Groundwater status is ‘poor (deteriorating)’.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality of the coastline has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• Therefore, whilst current water quality indicators show ecological and chemical levels around the Ramsar to</li> </ul>

<sup>101</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang= e>

Foulness Ramsar (Mid-Essex Coast Phase 5)	
	<p>be 'moderate' or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on the Ramsar. In addition not enough is known at the current time about the coastal processes such as exchange of water and drift patterns which could disperse contaminants from the nominated site southwards and into the remit of the Ramsar.</p> <p><b>Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>102</sup> indicates that the Essex Estuary complex is changing progressively.<sup>103</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat (one of the key interest features of the Ramsar. This has potentially serious implications for important bird assemblages/nationally important plants/invertebrates of the SPA.</li> <li>• The Foulness Ramsar is located approximately 12.5km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are unlikely.. There is a currently a southerly drift of littoral sediment<sup>104</sup> along the Essex coast between the nominated site and the Ramsar therefore sediment from development could be carried towards the designation It is likely that the majority of this sediment would be redistributed before reaching the SPA (for example along the Dengie SPA/Ramsar which falls between the two areas) and any quantities reaching the SPA are not likely to be at a level to cause significant impacts</li> <li>• At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse impacts on the integrity of the Ramsar through water quality pathways. There may also be impacts relating to disturbance and habitat loss however these are discussed separately in the</li> </ul>

<sup>102</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>103</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

<sup>104</sup> Euroasion Case Study: Essex Estuaries <http://www.coastalguide.org/projects/index.html>

Foulness Ramsar (Mid-Essex Coast Phase 5)	
	<p>context of the Mid-Essex Coast SPA/Ramsar as whole.</p> <ul style="list-style-type: none"> <li>Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>105</sup> (WeBS) Reports were consulted and revealed that two key interest species, Dark Bellied Brent and Grey Plover are on medium alert due to population declines, however it is unknown at the present time whether this decline is due to large scale problems or due to adverse conditions at a more local scale. Despite this any impacts as a result of changes to water quality, habitat loss or disturbance could contribute to the pattern of decline in turn impacting on the Ramsar.</li> </ul>
<b>Possible Avoidance and Mitigation Measures – <i>includes recommendations for policy/proposals</i></b>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible to conclude that there will not be adverse impacts on the integrity of the SPA through water quality pathways due to the dynamic nature of estuarine systems and the fact that contaminants can be dispersed over large distances.</p>

<sup>105</sup> <http://www.bto.org/webs/alerts/>

## Abberton Reservoir SPA

- **Location:** 005222E/514937N
- **Size (ha):** 726.2ha
- **Designation:** SPA

Abberton Reservoir SPA	
<b>Qualifying Features</b>	<p>The site qualifies under Article 4.1 of the EU Birds Directive by supporting populations of European importance of the following species listed on Annex 1 of the Directive:</p> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Golden Plover</a></li> </ul> <p>The site qualifies under Article 4.2 of the EU Birds Directive by supporting populations of importance of the following migratory species:</p> <p>During the breeding season:</p> <ul style="list-style-type: none"> <li>• <a href="#">Cormorant</a></li> </ul> <p>Over winter the area regularly supports:</p> <ul style="list-style-type: none"> <li>• <a href="#">Gadwall</a></li> <li>• <a href="#">Shoveler</a></li> <li>• <a href="#">Teal</a></li> <li>• <a href="#">Wigeon</a></li> <li>• <a href="#">Pochard</a></li> <li>• <a href="#">Tufted Duck</a></li> <li>• <a href="#">Goldeneye</a></li> <li>• <a href="#">Coot</a></li> <li>• <a href="#">Great Crested Grebe</a></li> </ul>

Abberton Reservoir SPA	
	<ul style="list-style-type: none"> <li>• Mute Swan</li> </ul> <p>Abberton Reservoir also qualifies under the Article 4.2 of the EU Birds Directive in that it supports an internationally important assemblage of waterfowl (wildfowl and waders).</p> <ul style="list-style-type: none"> <li>• Over winter, the area regularly supports 39,155 individual waterfowl (5 year peak mean 1991/2 - 1995/6)</li> </ul>
<b>Conservation Objectives</b>	<ul style="list-style-type: none"> <li>• Subject to natural change, maintain habitats for the internationally important populations of the regularly occurring Annex I bird species in favourable condition.</li> <li>• Subject to natural change, maintain habitats for internationally important populations of the regularly occurring migratory bird species.</li> <li>• Subject to natural change, maintain the habitats for internationally important assemblages of waterfowl in favourable condition.</li> </ul>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<p><b>Key species requirements;</b></p> <ul style="list-style-type: none"> <li>• Golden Plover utilize the damp grassland/pasture surrounding the reservoir for feeding in winter</li> <li>• Cormorants breeding at Abberton Reservoir are unique in that the birds nest in trees rather than on customary cliff ledges or rocky inlets</li> <li>• Great Crested Grebe, Gadwall, Shoveler, Teal, Wigeon, Pochard, Tufted Duck, Goldeneye, Coot and Mute Swan all use the reservoir as an autumn arrival point and for moulting, feeding and roosting over winter.</li> </ul> <p><b>Site-specific requirements;</b></p> <ul style="list-style-type: none"> <li>• Sympathetic management of water levels within the main water body is necessary for the maintenance of optimal water depths throughout the year. For example, the presence of extensive shallow water and wet marginal substrates will provide the feeding conditions required by a variety of wintering, passage and breeding wildfowl, such as dabbling ducks and waders, , whilst other species may require areas of water at least 3 metres in depth.</li> <li>• The protection of appropriate water quality is important for maintaining aquatic habitats and the range of species associated with them.</li> </ul>

Abberton Reservoir SPA	
	<ul style="list-style-type: none"> <li>• Resist development of land that would reduce the amount of open water below that necessary to maintain nature conservation interest.</li> <li>• Eradicate non-native species where they threaten important nature conservation interests</li> <li>• Standing waters and their surroundings are often also a popular environment for recreational activities such as angling and boating which should be managed sympathetically to avoid conflict with the management of the waterbody for nature conservation. Large areas of wetland should be kept free from disturbance during the breeding season, as well as during the winter months.</li> <li>• Other wetland habitats surrounding the open water may require some active management. For example, management should ensure that appropriate nesting and feeding conditions are maintained across the site for breeding, wintering and passage birds.</li> </ul>
<p><b>Vulnerabilities (includes existing pressures and trends)</b></p> <p><i>Details at Appendix 1</i></p>	<p>Abberton Reservoir is a public water supply reservoir. Reduced water availability, and increased demand, in recent years has led to generally low water levels; greater numbers of waders therefore use the site, and as a result no decrease in wildfowl has been attributed to low water levels. The possibility of raising the reservoir level to secure water supply is under consideration, and the requirement of waterfowl are a primary consideration of the associated EIA.</p> <p>Increases in the amount of nutrients within the waterbody (as a result of pollution from direct discharges and also from diffuse sources resulting from land management practices within the wider catchment) can lead to a loss of aquatic plants in favour of algae and impact upon invertebrate species, both of which are important food sources for a range of wetland birds.</p> <p>Water entering the site has elevated nitrate levels, leading in most summers to algal blooms, but as of yet there is no evidence of impacts on wildlife.</p> <p>Changes to the amount of water within the waterbody (by abstracting water from inflowing streams or raising the water level) can also alter nutrient regimes, as well as change the available area of some habitats. Increases in the amount of sediment entering a waterbody may smother stony beds, reduce water depth in shallow waterbodies and also increase the amount of nutrients present and should therefore be avoided.</p>

Abberton Reservoir SPA	
	<p>Other activities that can lead to a decrease in aquatic plants in favour of algae include the control or removal of the natural aquatic vegetation, or the intentional or accidental introduction of species such as bottom feeding coarse fish that uproot plants and disturb sediments on the bottom of the waterbody.</p> <p>Artificial waterbodies are susceptible to the introduction of invasive species such as non-native crayfish or plant species, for example, Australian swamp stonecrop, and some management may be necessary to control these where they occur.</p> <p>Recreational disturbance may impact on important bird assemblages.</p>
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Potential for impacts on key bird species from toxic contamination from accidental leakage</li> <li>• Potential for impacts on key bird species from radioactive discharges (accidental and routine)</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/coastal squeeze</b></p> <ul style="list-style-type: none"> <li>• Potential indirect impacts on key bird species through loss of important habitats in the Mid-Essex Coast SPA/Ramsar complex.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Possible indirect effects on key bird species through disturbance</li> </ul> <p>Please note No impacts on air quality of the Ramsar due to Site being approximately 8km away from the nominated site.</p>
<p><b>Potential In-combination effects (screening)</b></p>	<p>There could also be cumulative impacts associated with the current decommissioning of the adjacent nuclear power station. Mitigation measures are already being implemented to prevent impacts on through a Site Environmental Management Plan.<sup>106</sup></p>

<sup>106</sup> Bradwell Reactor Site Environmental Management Plan Magnox South (March 2008)

Abberton Reservoir SPA	
<p><b><i>What other plans and programmes could lead to in-combinations effects?</i></b></p>	<p>In addition the following plans have the potential to contribute to ‘in-combination impacts’. In combination impacts may be positive where the plans function is to actively manage identified issues (for example Catchment Abstraction Management Plans)</p> <p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents (Maldon,Chelmsford, Thurrock, Rochford, Colchester, Tendring)</li> <li>• River Basin Management Plan. Anglian River Basin District</li> <li>• Eco-Towns programme North-East Elsenham</li> <li>• The Combined Essex Catchment Abstraction Management Strategy</li> <li>• North and South Essex Flood Catchment Management Plans.</li> <li>• Decommissioning of Bradwell Nuclear Power Station</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Maldon District Core Strategy (under consultation)</li> <li>• Chelmsford Borough Core Strategy</li> <li>• Colchester Core Strategy</li> <li>• Tendring LDF (under preparation)</li> <li>• Essex Renewable Energy Strategy</li> <li>• Decommissioning of Bradwell</li> <li>• Flood Management Strategies (Crouch and Roach and Blackwater and Colne)</li> <li>• Essex Estuaries Coastal Habitat Management Plan</li> <li>• East Anglian Strategies (Shoreline Management Plans – In preparation)</li> </ul>

Abberton Reservoir SPA	
	<p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Essex County Council Minerals and Waste Development Framework</li> <li>• Local Transport Plan</li> <li>• Local Development Documents ( Maldon, Chelmsford, Rochford, Colchester, Thurrock and Tendring)</li> <li>• Essex Renewable Energy Strategy</li> </ul> <p><b>Raising of Abberton Reservoir</b> - There is also a proposal to raise the level of the water at Abberton Reservoir due to existing and predicted shortfalls in water supply within Essex. Raising of the reservoir is anticipated to have a positive benefit for the important bird species present by providing a significant increase in wetland habitat.</p>
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>107</sup> indicates that, the ecological and chemical status of the estuarine environments near to the nominated site are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• The Abberton Reservoir is closely linked with the Mid-Essex Coast SPA/Ramsar site as key bird interests of the former are also reliant on habitats within the latter and there is likely to be continuous movement of birds</li> </ul>

<sup>107</sup> Environment Agency River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – [http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=\\_e](http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=_e)

Abberton Reservoir SPA	
	<p>between designations. Changes to water quality within the estuary could therefore impact birds of Abberton Reservoir. It is not possible at this stage to determine whether these effects are likely to be significant and further information on bird movement, feeding, breeding and roosting patterns between designations is required.</p> <p><b>Habitat loss/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>108</sup> indicates that the Essex Estuary complex is changing progressively.<sup>109</sup> The presence of man-made features has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. This has potentially serious implications for important bird assemblages/nationally important plants/invertebrates of the Abberton Reservoir SPA which use such habitats.</li> <li>• Any further loss of habitat through the development at the nominated site could contribute to overall loss of habitat within the estuarine system upon which birds of Abberton Reservoir are reliant. As the current extent of potential habitat loss is unknown it is not possible to determine at this stage if impacts are likely to be significant.</li> <li>• The Abberton Reservoir is located approximately 8km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are not predicted.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The Abberton Reservoir is closely linked with the Mid-Essex Coast SPA/Ramsar site as key bird interests of the former are also reliant on habitats within the latter and there is likely to be continuous movement of birds between designations. It is therefore possible that if key bird species of the Abberton Reservoir frequently use habitat close to the nominated site they could be affected by disturbance and could for example suffer from displacement. This could have numerous impacts including effects on the health of the birds themselves as well as putting pressure on resources that remain. It is not possible at this stage to determine</li> </ul>

<sup>108</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>109</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

Abberton Reservoir SPA	
	<p>whether these effects are likely to be significant and further site specific information and details on bird movement, feeding, breeding and roosting patterns between designations is required.</p> <ul style="list-style-type: none"> <li>Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>110</sup> (WeBS) Reports were consulted and revealed that Wigeon, Teal and Golden Plover are on high alert and Gadwall, Shoveler, Tufted Duck and Coot are on medium alert at this site due to population declines. This is largely attributed to fluctuating water levels of the reservoir. Any impacts as a result of development at the nominated site could therefore add to the pattern of decline in turn impacting on the SPA.</li> </ul>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts. Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>Disturbance events in relation to bird species are most significant when they are irregular/ sudden and</li> </ul>

<sup>110</sup> <http://www.bto.org/webs/alerts/>

Abberton Reservoir SPA	
	<p>unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</p>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible to conclude that that there will not be adverse impacts on the integrity of the SPA through water quality, habitat loss and noise and disturbance pathways. This is due the movement of key bird species between Abberton Reservoir and the Mid-Essex Coast SPA/Ramsar site.</p>

## Abberton Reservoir Ramsar

- **Location:** 005222E/514937N
- **Size (ha):** 726.2ha
- **Designation:** Ramsar

Abberton Reservoir Ramsar	
<b>Qualifying Features</b>	<p><b>Ramsar criterion 5</b></p> <p>Assemblages of international importance</p> <ul style="list-style-type: none"> <li>• Species with peak counts in winter: 23787 waterfowl (5 year peak mean 1998/99- 2002/2003)</li> </ul> <p><b>Ramsar criterion 6 – species/populations occurring at levels of international importance</b></p> <p>Qualifying species/populations</p> <p>Species with peak counts in spring/autumn</p> <ul style="list-style-type: none"> <li>• Gadwall</li> <li>• Northern Shoveler</li> </ul> <p>Species with peak counts in winter</p> <ul style="list-style-type: none"> <li>• Eurasian Wigeon</li> </ul> <p>Species/populations identified subsequent to designation for possible further consideration under criterion 6</p> <p>Species with peak counts in spring/autumn</p> <ul style="list-style-type: none"> <li>• Mute Swan</li> <li>• Common Pochard</li> </ul>
<b>Conservation Objectives</b>	No information currently available on conservation objectives specifically relating to the Ramsar site however the

<b>Abberton Reservoir Ramsar</b>	
	Abberton Reservoir Ramsar covers the same area as the Abberton Reservoir SPA. Conservation objectives for the SPA will therefore overlap with requirements for the Ramsar.
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	See Abberton Reservoir SPA
<b>Vulnerabilities (includes existing pressures and trends)</b>	See Abberton Reservoir SPA
<i>Details at Appendix 1</i>	
<b>Predicted Impacts</b>  <i>What are the issues arising from the plan and how might the site be affected?</i>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Potential for impacts on key bird species from toxic contamination from accidental leakage</li> <li>• Potential for impacts on key bird species from radioactive discharges (accidental and routine)</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/coastal squeeze</b></p> <ul style="list-style-type: none"> <li>• Potential indirect impacts on key bird species through loss of important habitats in the Mid-Essex Coast SPA/Ramsar complex.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Possible indirect effects on key bird species through disturbance</li> </ul> <p>Please note: No impacts on air quality of the Ramsar due to Site being approximately 8km away from the nominated site.</p>
<b>Potential In-combination effects (screening)</b>	As for Abberton Reservoir SPA
<i>What other plans and</i>	

Abberton Reservoir Ramsar	
<b>programmes could lead to in-combinations effects?</b>	
<b>Appropriate Assessment</b>	
<b>Likelihood of adverse effect on integrity:</b>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>111</sup> indicates that, the ecological and chemical status of the estuarine environments near to the nominated site are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients.</li> <li>• The Abberton Reservoir is closely linked with the Mid-Essex Coast SPA/Ramsar site as key bird interests of the former are also reliant on habitats within the latter and there is likely to be continuous movement of birds between designations. Changes to water quality within the estuary could therefore impact birds of Abberton Reservoir. It is not possible at this stage to determine whether these effects are likely to be significant and further information on bird movement, feeding, breeding and roosting patterns between designations is required.</li> </ul> <p><b>Habitat loss/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>112</sup> indicates that the Essex Estuary complex is changing progressively.<sup>113</sup> The presence of man-made features</li> </ul>

<sup>111</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>

UKTG – Water Framework Directive Website: <http://www.wfduk.org/>

Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang=e>

<sup>112</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>113</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

	<b>Abberton Reservoir Ramsar</b>
	<p>has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. This has potentially serious implications for important bird assemblages/nationally important plants/invertebrates of the Abberton Reservoir SPA which use such habitats.</p> <ul style="list-style-type: none"> <li>• Any further loss of habitat through the development at the nominated site could contribute to overall loss of habitat within the estuarine system upon which birds of Abberton Reservoir are reliant. As the current extent of potential habitat loss is unknown it is not possible to determine at this stage if impacts are likely to be significant.</li> <li>• The Abberton Reservoir is located approximately 8km from the nominated site so direct effects of habitat loss and coastal squeeze as a result of development such as upgraded coastal protection are not predicted.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The Abberton Reservoir is closely linked with the Mid-Essex Coast SPA/Ramsar site as key bird interests of the former are also reliant on habitats within the latter and there is likely to be continuous movement of birds between designations. It is therefore possible that if key bird species of the Abberton Reservoir frequently use habitat close to the nominated site they could be affected by disturbance and could for example suffer from displacement. This could have numerous impacts including effects on the health of the birds themselves as well as putting pressure on resources that remain. It is not possible at this stage to determine whether these effects are likely to be significant and further site specific information and details on bird movement, feeding, breeding and roosting patterns between designations is required.</li> <li>• Information on water bird trends at this site and their regional (sub-national) and national contexts contained within Wetland Bird Survey<sup>114</sup> (WeBS) Reports were consulted and revealed that Wigeon, Teal and Golden Plover are on high alert and Gadwall, Shoveler, Tufted Duck and Coot are on medium alert at this site due to population declines. This is largely attributed to fluctuating water levels of the reservoir. Any impacts as a result of development at the nominated site could therefore add to the pattern of decline in turn impacting on the Ramsar.</li> </ul>

<sup>114</sup> <http://www.bto.org/webs/alerts/>

Abberton Reservoir Ramsar	
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts. Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>• Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> </ul>
<p><b>Conclude no adverse effect on integrity?</b></p>	<p>It is not possible to conclude that that there will not be adverse impacts on the integrity of the Ramsar through water quality pathways, habitat loss and coastal squeeze. This is due the movement of key bird species between Abberton Reservoir and the Mid-Essex Coast SPA/Ramsar site.</p>

## Mid-Essex Coast SPA/Ramsar

The following table summarises impacts on important bird assemblages which need to be considered in the context of the Mid-Essex Coast SPA/Ramsar as a whole. This includes water quality impacts due to the potential for contaminants being dispersed over long distances and impacts on birds as there is likely to be considerable movement of bird species between individual designations within the complex, therefore any impacts on birds using habitat close to the nominated site could have likely significant effects on SPA/Ramsar sites within the Mid-Essex Coast complex that are of considerable distance away.

Mid-Essex Coast SPA/Ramsar	
<b>Qualifying Features</b>	See component designations for qualifying feature information <ul style="list-style-type: none"> <li>• Dengie SPA (Mid-Essex Coast Phase 1)</li> <li>• Dengie Ramsar (Mid-Essex Coast Phase 1)</li> <li>• Colne Estuary SPA (Mid-Essex Coast Phase 2)</li> <li>• Colne Estuary Ramsar (Mid-Essex Coast Phase 2)</li> <li>• Crouch and Roach Estuaries SPA (Mid-Essex Coast Phase 3)</li> <li>• Crouch and Roach Estuaries Ramsar (Mid-Essex Coast Phase 3)</li> <li>• Blackwater Estuary SPA (Mid-Essex Coast Phase 4)</li> <li>• Blackwater Estuary Ramsar (Mid-Essex Coast Phase 4)</li> <li>• Foulness SPA (Mid-Essex Coast Phase 5)</li> <li>• Foulness Ramsar (Mid-Essex Coast Phase 5)</li> </ul>
<b>Conservation Objectives</b>	See component designations
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	See component designations
<b>Vulnerabilities (includes</b>	See component designations

Mid-Essex Coast SPA/Ramsar	
<p>existing pressures and trends)</p> <p><i>Details at Appendix 1</i></p>	
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Potential for impacts on key habitats and key bird species from toxic contamination from accidental leakage</li> <li>• Potential for impacts on key habitats and key bird species from radioactive discharges (accidental and routine)</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/coastal squeeze</b></p> <ul style="list-style-type: none"> <li>• Potential for habitat loss to contribute to overall habitat decline within the Essex Estuaries.</li> <li>• Potential indirect impacts on key bird species through loss of important habitats</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Possible indirect effects on key bird species through disturbance</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>See component designations</p>

Mid-Essex Coast SPA/Ramsar	
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Current Environment Agency data<sup>115</sup> indicates that, the ecological and chemical status of the estuarine environments near to the nominated site are assessed as ‘moderate’ and ‘good’ respectively. By 2015 the EA predicts that both the ecological and chemical status will be maintained.</li> <li>• Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Environmental condition data from the EA indicates that water quality within the estuarine environment has improved greatly in recent years, although urban and agricultural diffuse outputs are increasingly being highlighted as sources of contamination, particularly nutrients. Whilst current water quality indicators show ecological and chemical levels around the the nominated site to be ‘moderate’ or higher, it is not possible (without further information on discharge levels and quantity/quality) to conclude that discharges from the nominated site (radioactive and non-radioactive) will not have an adverse effect on habitats and important bird populations of the Mid-Essex Coast SPA/Ramsar.</li> <li>• Any changes of water quality as a result of development at the nominated site could also affect the integrity of the Mid-Essex Coast SPA/Ramsar as a whole due to movement of birds between sites. In addition given the dynamic nature of the estuarine system contaminants could be spread over large distances affecting both habitats and species further afield. It is not possible at this stage to determine whether these effects are likely to be significant and further information on bird movement, feeding, breeding and roosting patterns between designations is required as well as further information regarding coastal processes such as exchange of water and drift patterns which could result in dispersal of contaminants.</li> </ul> <p><b>Habitat Loss/Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• The Essex Estuaries Coastal Habitat Management (CHaMP) produced by the Environment Agency<sup>116</sup> indicates that the Essex Estuary complex is changing progressively.<sup>117</sup> The presence of man-made features</li> </ul>

<sup>115</sup> Environment Agency: River Basin Management Plan: Anglian River Basin District. <http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/anglian/Intro.aspx>  
 UKTG – Water Framework Directive Website: <http://www.wfduk.org/>  
 Environmental Agency – <http://maps.environment-agency.gov.uk/wiyby/wiybyController?ep=maptopics&lang= e>

	Mid-Essex Coast SPA/Ramsar
	<p>has constrained the ability of inter-tidal habitats, (notably saltmarsh) to move landward in response to sea level rise. Analysis indicates that over the next 50 years profound changes could occur in the distribution and extent of coastal habitat with changes including significant loss of saltmarsh habitat. This has potentially serious implications for important bird assemblages which use such habitats.</p> <ul style="list-style-type: none"> <li>• Other than potential locations, the extent of loss of habitats used by birds for the construction of cooling water infrastructure, upgraded costal protection and a marine landing facility is currently unknown and its significance in the context of wider habitat changes cannot be assessed. It is possible that these changes may act cumulatively or accelerate changes identified by the CHaMP and could therefore have significant effects on birds within the Mid-Essex Coast SPA/Ramsar as a whole. At this strategic stage where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects on birds in the wider context through habitat loss and coastal squeeze.</li> <li>• Many of the SSSI's of the Mid-Essex Coast SPA/Ramsar complex are currently in unfavourable condition. Development which encroaches onto the important habitats within the Mid-Essex Coast SPA/Ramsar could contribute to overall decline of habitats within the complex. As the current extent of potential habitat loss is unknown it is not possible to determine at this stage if impacts are likely to be significant</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• The important bird assemblages of the Mid-Essex Coast SPA/Ramsar complex are particularly vulnerable to disturbance from close human proximity and the screening noted the potential for construction and decommissioning phases in particular to create disturbance events, particularly through noise but also through light pollution impacts.</li> <li>• Given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds in the wider context of the Mid-Essex Coast SPA/Ramsar complex or to conclude that there will be no significant effect. Further site specific information is required as well as further details on bird movement, feeding, breeding and roosting patterns between designations.</li> <li>• Information on water bird trends and their regional (sub-national) and national contexts contained within</li> </ul>

<sup>116</sup> The Essex Estuaries Coastal Habitat Management Plan: Executive Summary (October 2002) <http://www.eclife.naturalengland.org.uk/champs/pilots.asp>

<sup>117</sup> CHaMPs are specifically focused on the integrity of N2K and Ramsar sites.

Mid-Essex Coast SPA/Ramsar	
	<p>Wetland Bird Survey<sup>118</sup> (WeBS) Reports were consulted and revealed that numerous key bird species within the SPA/Ramsar complex Wigeon are on high/medium alert due to population declines. This is attributed mainly to changes at a larger scale rather than being site specific apart from declines at Abberton Reservoir which are largely attributed to fluctuating water levels within the reservoir. Any impacts as a result of development at the nominated site could add to patterns of decline in turn impacting on the SPA/Ramsar complex as a whole.</p>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation/ Coastal Squeeze</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts through careful consideration of site layout and design and technologies/methods which could be used to minimise impacts. Connectivity between habitats should be maintained as should protective buffer zones around sensitive areas. In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>• Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would</li> </ul>

<sup>118</sup> <http://www.bto.org/webs/alerts/>

Mid-Essex Coast SPA/Ramsar	
	<p>need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</p>
<p><b>Conclude no adverse effect on integrity?</b></p>	<p>It is not possible to conclude that there will not be adverse impacts on the integrity of the Mid-Essex Coast SPA/Ramsar through water quality pathways, habitat loss and coastal squeeze and disturbance. This is due to lack of more detailed information required to make an assessment such as movements of birds within the component designations and their feeding, roosting and breeding patterns.</p>

## Outer Thames Estuary SPA

- **Location:** 1154431E/51342546N
- **JNCC Site Code:** Not yet allocated
- **Size:** 393,734.18 ha
- **Designation:** SPA

The majority of information for the Outer Thames SPA has been obtained from Natural England consultation documents found at the following location: <http://www.naturalengland.org.uk/ourwork/marine/sacconsultation/default.aspx>

Outer Thames Estuary SPA	
<b>Qualifying Features</b>	<p>The site regularly supports more than 1% of the GB population of the following species listed on Annex I of the EC Birds Directive:</p> <ul style="list-style-type: none"> <li>• Red-throated Diver <i>Gavia stellata</i> – 6,486 individuals wintering between 1989 – 2006/07. The site is the most important wintering site in the UK for this species.</li> </ul>
<b>Conservation Objectives</b>	<p>Subject to natural change, maintain in favourable condition the internationally important populations of the regularly occurring Annex I Species:</p> <ul style="list-style-type: none"> <li>• Red-throated Diver – and its supporting habitats and species.</li> </ul> <p>Relevant habitats include shallow coastal waters and areas in the vicinity of sub-tidal sandbanks.</p>
<b>Key Environmental Conditions (factors that maintain site integrity)</b>	<ul style="list-style-type: none"> <li>• Wintering Red-throated Divers occur mainly in waters between 0-20m deep (less frequently in depths of around 30m) and in areas with extensive sandy substrate. Sublittoral, shallow (&lt;20m) sandbank habitat is therefore very important for the species.</li> <li>• There is also some evidence of association with areas of salinity change (for example, where low salinity</li> </ul>

Outer Thames Estuary SPA	
	<p>river water meets higher salinity sea level water). Such areas tend to fluctuate with state of tide, volume of river flow and wind conditions.</p> <ul style="list-style-type: none"> <li>The diet of the Red-throated Diver is principally small fish of a variety of species (particularly of the cod family, herring and sprats) and there is evidence to suggest that, in some areas, the higher numbers of birds are associated with shoals of sprats.</li> </ul>
<b>Vulnerabilities (includes existing pressures and trends)</b>	<p>Red-throated Divers in the Outer Thames Estuary are sensitive to the following:</p> <p><b>Physical loss of supporting habitat</b> (for example, offshore development, disposal of dredge spoil) Physical loss by removal or smothering of any of the habitats on which Red-throated Divers depend may result in the loss of foraging sites and therefore the reduction of a food resource for the overwintering population.</p> <p><b>Physical damage to habitat</b> (for example, siltation, abrasion, selective extraction) Red-throated Divers are known to associate with sandbank features and, although benthic sandbank communities are, in general, relatively resilient to physical damage, repeated damage to the habitats on which the species depends may result in a reduction in their value as foraging sites for the overwintering population.</p> <p><b>Non physical disturbance</b> Red-throated Divers are highly sensitive to non-physical disturbance by noise and visual presence during the winter. Feeding can be disturbed by movements of objects (for example, boats and wind turbine rotors) and increases in noise disturbance displacing birds from their feeding grounds. These can cause birds to cease feeding or fly away and in response they could a) increase their energy requirements at their present (disturbed) feeding sites or b) move to an alternative less favoured feeding or roosting site. Such a response affects energy budgets and food intake and possibly survival. Overwintering birds, which are frequently subject to harsh weather conditions and must lay down fat reserves in order to migrate to breeding grounds, are particularly susceptible to adverse effects resulting from disturbance.</p> <p><b>Toxic contamination of Red-throated Divers and their supporting habitats</b> A number of operators will discharge effluent upstream into the Thames Estuary and into the adjacent coastal</p>

	<b>Outer Thames Estuary SPA</b>
	<p>waters (including low levels of radionuclides and heavy metals). Significant dilution of these low inputs, together with high energy environments associated with sandbanks, mean that the habitat has a moderate sensitivity to toxic contamination from these sources.</p> <p>In the case of the Red-throated Diver, the sensitivity to synthetic chemicals such as PCBs is moderate. PCBs accumulate through the food chain in the tissues of marine organisms and could be considerable once they reach the fish on which Red-throated Divers feed. If marine pollution were to occur, there is the potential for exposure to PCBs to change.</p> <p>Large oil and chemical spills affecting shallow sandbank habitats can have a detrimental effect on bird populations by significantly affecting food sources and presenting a threat to diving and feeding seabirds. Birds are particularly vulnerable when moulting. Dispersants used to disperse the oil may also be harmful to the species. Princes Channel (which runs through the southern area of the Outer Thames SPA) carries a significant amount of vessel traffic in and out of the ports of the Thames Estuary. In addition Fisherman's Gat is an active commercial shipping channel and smaller vessels use the shallower inshore channels across the site. The risk of contamination by accidental spillages or fuel cargo is therefore increased and a small level of contamination will exist as a result of normal shipping activities. Large ports in the area also increase the risk of exposure.</p> <p><b>Non-toxic contamination of Red-Throated Divers and their supporting habitats</b>                      Non-toxic contamination through nutrient loading, organic loading and changes to thermal regime could impact upon prey species and distribution. Non toxic contamination through the impact from an oil spill could be significant. Oil on the feathers of birds could lead to loss of insulation, reduced buoyancy and possible drowning.</p> <p><b>Selective extraction of prey species</b>                      Removal of fish species and larger molluscs, for example, can have significant impacts upon the structure and functioning of benthic communities over and above the physical effects of fishing methods, particularly as some fish species fill upper roles in the trophic web. In addition, it has the potential to directly remove prey species. The mechanisms for these pressures to impact upon Red-throated Divers may be a direct or indirect reduction in food availability for the overwintering population.</p>

	Outer Thames Estuary SPA
	<p><b>Non-selective extraction of Red-throated Divers</b></p> <p>Non-selective extraction can occur through entanglement in nests or through bird strike. Static nets can be considered a significant risk to the species through entanglement and reduction of food availability. Entanglement in static nets is a major cause of known mortality in Red-throated Divers.</p> <p>Impacts may also occur from collision with wind turbines if birds fly at a height above 20m. However it has been observed that they generally fly below this height.</p>

Outer Thames Estuary SPA	
<p><b>Predicted Impacts</b></p> <p><i>What are the issues arising from the plan and how might the site be affected?</i></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Increased/ altered drainage from earthworks and excavation (for example, could lead to nutrient enrichment).</li> <li>• Potential for toxic contamination of Red-throated Divers and their prey from accidental leakage</li> <li>• Radioactive discharges (accidental and routine)</li> <li>• Alteration of flow from abstraction</li> <li>• Changes to water temperature and possible local abrasion of habitats from discharge</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Potential loss of feeding habitat used by Red-throated Divers (for example, sandbanks) to accommodate water cooling infrastructure, marine landing facility and upgraded coastal protection.</li> <li>• Potential loss of feeding habitat used by Red-throated Divers (for example, sandbanks) as a result of changes to sediment regimes from upgraded coastal protection.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Potential impacts on Red-throated Divers from noise and visual disturbance in particular.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Local level impacts (reduced air quality, NOx gases from road/ transport/ generation sources) arising from construction, operation, decommissioning activities.</li> </ul>
<p><b>Potential In-combination effects (screening)</b></p> <p><i>What other plans and programmes could lead to in-combinations effects?</i></p>	<p>Unknown at the current time, as no other plans or programmes are noted which address this SPA. In combination impacts from the following current and proposed economic activities in the Outer Thames Estuary could, however, arise:</p> <p><b>Aggregate extraction</b></p> <p>The Anglian Offshore (East Coast) region and the Thames Region, within which the SPA lies, are both strategically important areas for this industry. Despite a decrease in extraction levels from the East Coast region, there remain large quantities of primary aggregate, and extraction is increasing in the Thames region</p>

	Outer Thames Estuary SPA
	<p>steadily since production from newly discovered large resources started in 2005. Depending on local demand and depletion of land-won aggregates, intensity may further increase in the next ten years. Furthermore, data from the Crown Estate (<a href="http://www.thecrownestate.co.uk/dredge_areas_statistics">www.thecrownestate.co.uk/dredge_areas_statistics</a>) indicate that the industry is investigating potential for extraction in areas located partially in the SPA. Whilst marine aggregate extraction is a heavily regulated activity (ongoing and new plans or projects), a sudden increase in new licence applications could cause displacement and disturbance of Red-throated Divers, loss of/ damage to supporting habitat through extraction and dredging, as well as indirect impacts on prey distribution and abundance through disturbance to the seabed and increased turbidity in the water column.</p> <p><b>Oil and Gas</b></p> <p>A number of pipeline routes have been reviewed for transporting CO<sub>2</sub> from The Thames Cluster to the Hewett Gas Field, including an off-shore route, which would pass through the SPA for approximately 143km (Capturing Carbon, Tackling Climate Change: A Vision for a CCS Cluster in the South East, E-ON, April 2009). No environmental supporting information was available for the above (un-consented) proposal. However, it is likely that vessels used to maintain, supply or construct structures in the SPA could result in potentially significant levels of disturbance of the Red-throated Divers. In addition, if the gas pipelines within the site were to leak, this could potentially cause toxic contamination of the site (though this is likely to be a temporary impact).</p> <p><b>Renewables</b></p> <p>Two operating wind farms (Kentish Flats and Scroby Sands) are fully and partially located within the site respectively. The Gunfleet Sands (GS) wind farm, which is located fully within the site, consists of a Round 1 project and a Round 2 project and is currently under construction off the Essex Coast at Clacton-on-Sea. The proposed Round 2 extension is a 64MW offshore wind farm comprising up to 22 turbines and associated inter-turbine cables. An Environmental Statement for GS Round 2 was prepared in June 2007 and took into account the possible future designation of the Outer Thames SPA. Extensive surveys showed that GS2 is located in an area of relatively low bird density, although species are present that are of conservation importance, including Red-throated Diver. A systematic assessment of the potential impacts on birds arising from the proposed construction, operation and decommissioning of the wind farm, alone and in-combination with other developments in the Thames Estuary, has been undertaken. Potential impacts assessed included displacement from the wind farm site due to the presence of turbines, collision mortality, habitat loss and the risk of creating a</p>

	<b>Outer Thames Estuary SPA</b>
	<p>'barrier' to migratory birds. Possible effects upon the potential Thames Estuary SPA were also assessed and it was predicted that GS2, either alone or in-combination with other developments or activities, will have no impact upon the SPA.</p> <p>Construction on Phase 1 (up to 175 turbines) of the London Array wind farm project is likely to start in spring 2011 and will cover an area of approximately 100km. Phase 2 of the London Array project has consent, but permission to construct is dependent on the results of monitoring from Phase 1 demonstrating no significant impact on the Red-throated Diver population. London Array Phases 1 and 2 are both fully within the SPA. The noise from pile driving the monopiles and the noise and visual presence of vessels used for construction are likely to disturb and displace Red-throated Divers (Outer Thames SPA Draft Consultation Impact Assessment, November 2009). There is a licence condition for the development, which specifies that from 1 November to 31 March all vessels involved in construction operations must approach the site from the south using main shipping channels and leave by the same route to minimise any potential disturbance to Red-throated Divers.</p> <p>In terms of future development of renewables within the Outer Thames, the Crown Estate has issued an Invitation to Tender to developers for the Round 3 offshore wind farm leasing programme for the delivery of up to 25 Giga Watt (GW) in capacity of potential new offshore wind farm sites by 2020. Round 3 overlaps with 7.8% of the total area of the SPA.</p> <p><b>Cables</b> A number of operational telecommunication cables pass through the site amounting to a total length of 225km. Most planned cable laying activity is replacement or upgrading of existing cables and could potentially disturb and displace Red-throated Divers, although the effects are likely to be localised and temporary.</p> <p><b>Fisheries</b> The Thames Estuary supports important commercial fisheries, as well as estuarine and marine recreational angling. Approximately 180 commercial fishing boats operate within the area of the estuary. Fishing intensity may change in the future. However, the impacts of the fisheries industry on the SPA are difficult to predict given the paucity of information on the likely intensity of fishing over the next ten years. The presence of vessels fishing in the site could potentially disturb and displace Red-throated Divers, particularly in the areas where</p>

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	<p>there are more productive fisheries. In addition, fishing could directly reduce the abundance of fish that the designated species feed upon, both through extraction of target species and as by-catch.</p> <p><b>Shipping (including dredging of channels)</b>                      The Port of London is one of the UK's largest ports and the Port of London Authority (PLA) is the body responsible for ensuring safe navigation in the tidal Thames. Part of the PLA's operations is to ensure that shipping channels and berths are maintained or, in some limited cases, created. This requires occasional maintenance dredging of existing shipping channels that have suffered from siltation or capital dredging where a new channel or berth is required. This could potentially result in loss/ damage to supporting habitats for Red-throated Divers, as well as disturbance from vessels.</p> <p>The port of Felixstowe is the UK's largest container port and is capable of handling the world's largest container ships. It is currently undergoing considerable expansion. In addition, new port capacity at Great Yarmouth is currently under construction and is expected to accommodate container traffic in various forms. Such expansions will lead to more shipping movements within the Outer Thames, which may lead to additional disturbance events, although, as Red-throated Divers are known to avoid existing shipping channels, use of those channels may not have any further impact on birds. Increased shipping activity within the area, including ship-to-ship oil transfers, could result in an increased likelihood of introduction of toxic contamination within the SPA.</p> <p><b>Recreation</b>                      There is a high level of use of the site by all forms of recreational vessels. The majority of these activities are restricted to inshore waters of the estuaries and coast, although there are a large number of yacht clubs within the site which use waters further offshore.</p> <p><b>Land based sources of pollution</b>                      Toxic and non-toxic pollutants enter the Thames Estuary and adjacent coastal waters from direct point source discharges of effluents or diffuse sources, such as agricultural run-off via rivers. Toxic and non-toxic discharges could potentially affect supporting habitats, and hence prey availability, through contamination of sediment, nutrient loading and changes in turbidity, water temperature and salinity. Point source discharges are currently</p>

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	controlled through licensing by the Environment Agency.
<p><b>Appropriate Assessment</b></p> <p><b>Likelihood of adverse effect on integrity:</b></p>	<p><b>Water Resources and Quality</b></p> <ul style="list-style-type: none"> <li>• Radioactive discharges are subject to targets monitored by the EA and, of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in its sector report for the nuclear industry).<sup>119</sup> In particular, it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.</li> <li>• Assessments made by the Environment Agency in 2004 under the Water Framework Directive (WFD) and updated in the River Basin Management Plans in 2009 indicate that the transitional (including estuarine) and coastal waters within the area are at risk of failing to reach the environmental standards that are required under the WFD<sup>120</sup> and organic source pollution in particular is identified as a potential future risk. The WFD will, however, be addressing coastal water quality issues and discharges will be controlled to meet ‘Good Ecological Status’ as specified by the Directive. The areas of the SPA beyond 12 nautical miles are so far offshore that they are unlikely to be significantly affected by pollution from the land.</li> <li>• The sheltered coastal areas and transitional water types of the SPA are at most risk from impacts related to water resources and quality. The more exposed offshore areas of the SPA are less at risk, as there is greater dilution and dispersion of contaminants. A number of operators discharge effluent into the Thames Estuary and into adjacent coastal waters. Direct discharges into the SPA include low levels of radionuclides, and heavy metals. However, significant dilution afforded to these low inputs, together with the high energy environments associated with sandbanks, mean that they have a moderate sensitivity to toxic contamination from these sources.</li> <li>• Although discharges will be strictly monitored by the Environment Agency, it is not possible (without further information on discharge levels and quality and quantity) to conclude that discharges, both radioactive and non-radioactive, will not have an adverse effect on Red-throated Divers that use inshore/transitional waters of the SPA. Toxic and non-toxic contamination could potentially affect the habitats of fish/invertebrates that the birds feed upon through contamination of sediment, increases in nutrients and changes in turbidity, water temperature and salinity.</li> </ul>

<sup>119</sup> <http://publications.environment-agency.gov.uk/pdf/GEHO1105BJVG-e-e.pdf>

<sup>120</sup> <http://www.environment-agency.gov.uk/research/planning/33292.aspx>

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	<p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Loss of sandbank habitat within the SPA could result in significant effects on Red-throated Divers, which rely on this habitat for feeding. It is thought that sandbanks may have a functional role (as nursery, spawning, feeding or in providing shelter) in supporting fish species that form the prey of Red-throated Divers. Overall sensitivity of the Red-throated Divers to damage to supporting habitat is considered to be moderate.</li> <li>• Sandbanks are dynamic systems and are constantly changing. The Thames Estuary is subject to two distinct tidal influences. North Sea tides enter the estuary from the northeast and are responsible for the formation of sandbanks running in a northeast – southwest direction in the northern part of the estuary. The second tidal influence is from the English Channel, with these tides entering the southern part of the estuary around the North Kent coast and influencing the formation of banks lying in an east – west orientation in the southern part of the estuary.</li> <li>• Any disturbance which interferes with the hydrological regime in the vicinity of sandbanks can be detrimental, as maintenance of sandbanks is dependent on current direction and speed. Adjacent coastal development and construction of sea defences can potentially change hydrological regimes.</li> <li>• As only locations of cooling water infrastructure, upgraded coastal protection and a marine landing facility have been provided, the extent of loss (either directly or indirectly) of sandbank habitat within the SPA from construction activities along the coastal foreshore is currently unknown and the significance in the context of wider habitat changes cannot be assessed. Of most concern would be any sandbanks which occur within the inter-tidal zone close to the nominated site.</li> <li>• At this strategic stage, where detailed development plans are unknown, it is not possible to conclude that that there will not be adverse effects on the integrity of the SPA through habitat loss or damage.</li> </ul> <p><b>Disturbance (noise, light and visual)</b></p> <ul style="list-style-type: none"> <li>• Red-throated Divers are particularly sensitive to noise and visual disturbance from human activity and the screening assessment noted the potential for construction and decommissioning phases in particular to create disturbance events. This could lead to displacement of birds from favoured feeding areas and could affect their chances of survival.</li> </ul>

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	<ul style="list-style-type: none"> <li>• Initial results of monitoring undertaken from some operational offshore wind farms, has shown displacement of 80-100% divers from the development footprint and the surrounding buffer area (although further work is required to corroborate these findings). This disturbance is thought to be caused by the turbines and boat-based maintenance activities.</li> <li>• Other research has found that Red-throated Divers usually take off ahead of boats of all sizes, which may disturb individuals as far as 2 km away. Red-throated Divers have also been shown to be absent from the major shipping lanes off north-west Germany during winter, yet undisturbed waters either side and between the separation lanes carry the expected number of birds.</li> <li>• During survey work carried out within the Greater Thames between 1989 and March 2005, Red-throated Divers were found to occur throughout the entire area of the Outer Thames Estuary, but were at greatest density and with greatest frequency off the coast of Suffolk and over sandbanks in the centre of the estuary and those extending towards the coast of south Essex and part of north Kent.</li> <li>• As the nominated site lies directly adjacent to the SPA, and given that the full extent and nature of the development proposals is currently unknown, it is not possible to determine how the nature or timing of the development may affect interest feature birds or to conclude that there will be no significant effect.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• The Outer Thames Estuary SPA falls within 1km of the nominated site. Information obtained from Maldon District Council<sup>121</sup> (Bradwell falls within the district of Maldon) indicates that air quality in the District is generally good with no risk of air quality objectives being exceeded. The Environment Act 1995 gives local authorities the responsibility to periodically review and assess local air quality and, where air quality objectives are unlikely to be achieved, to designate air quality management areas. To this end, Maldon District Council (MDC) has developed an action plan aimed at reducing air pollution and carries out monthly monitoring of nitrogen dioxide at nine sites within its district area; however, none are near (or deemed to be required near) Bradwell. According to the MDC website, other pollutants (for example, particulate matter (PM10), carbon monoxide, lead, ozone, sulphur dioxide and volatile organic compounds including benzene and 1, 3-butadiene) are not currently significant in the district of Maldon.</li> <li>• The Environment Agency assesses that non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides</li> </ul>

<sup>121</sup> Maldon District Council [http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air\\_quality\\_monitoring.htm](http://www.maldon.gov.uk/LivingHere/EnvironmentalHealth/Pollution/air_quality_monitoring.htm)

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	<p>and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and does not consider them to be an environmental priority.</p> <ul style="list-style-type: none"> <li>• The Environment Agency’s most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.<sup>122</sup></li> <li>• Information provided by the Air Pollution Information System (APIS)<sup>123</sup> indicates that air quality in the area is good, with pollution levels for all key pollutants (sulphur dioxide, nitrogen dioxide etc.) being low.</li> <li>• Air quality is not specified as a vulnerability for Red-throated Divers or their supporting habitats and, given the large size of the SPA (393734.18ha), it is considered unlikely that any local level air quality impacts will reach a level that results in the integrity of the SPA being compromised.</li> </ul>
<p><b>Possible Avoidance and Mitigation Measures – includes recommendations for policy/proposals</b></p>	<p><b>Water Resource and Quality</b></p> <ul style="list-style-type: none"> <li>• Avoiding adverse effects on surface, ground and estuarine waters is primarily the responsibility of the water companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation). However, the Nuclear NPS can direct requirements for efficiency of water use and require that issues relating to supply and discharge (including potential effects on N2K sites) are in place prior to the implementation of the nominated site proposals.</li> </ul> <p><b>Habitat (and species) Loss and Fragmentation</b></p> <ul style="list-style-type: none"> <li>• Where proposals for design and build remain under development, the Nuclear NPS should seek to prioritise the avoidance of direct habitat impacts on the SPA through careful consideration of site layout and design of any development within the coastal fringe (for example, cooling water culverts, marine landing facility and coastal protection measures). In the event of any habitat being lost these should be re-created elsewhere. Any direct impacts that cannot be avoided, including through alternatives, or mitigated should be addressed by compensation measures agreed with the Statutory Bodies and implemented prior to the commencement of development proposals.</li> <li>• The Nuclear NPS should seek to prioritise the use of technologies/methods which could be used to minimise impacts to habitats. Examples include use of soft engineering for any upgraded coastal</li> </ul>

<sup>122</sup> Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

<sup>123</sup> Air Pollution Information System <http://www.apis.ac.uk/>

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	<p>protection, use of permeable materials for the marine landing facility (so that sediment flows along the coast are not interrupted) and scour protection at the point of cooling water discharge.</p> <ul style="list-style-type: none"> <li>• In addition, protection measures should be incorporated into water intake systems so as to avoid depleting important food sources for birds, such as fish/invertebrates</li> </ul> <p><b>Disturbance (noise, light, visual)</b></p> <ul style="list-style-type: none"> <li>• Disturbance events in relation to bird species are most significant when they are irregular, sudden and unpredictable. Noise, light and visual impacts can be managed at a site level through phasing and timing that takes account of feeding cycles and should be supported by information on flight lines/ migration routes/ feeding and roosting areas. Precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.</li> </ul> <p><b>Air Quality</b></p> <ul style="list-style-type: none"> <li>• Air quality impacts are not assessed as being significant in relation to the SPA. However, it is appropriate that the Nuclear NPS takes account of potential air quality impacts through requirements, particularly at a local level for sustainable transport plans, including, for example, the use of non-road transport where possible, phasing of development and robust monitoring at sites to track changes. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the operation and de-commissioning of the existing power station at Bradwell and a new power station on the nominated site overlaps.</li> </ul>
<b>Conclude no adverse effect on integrity?</b>	<p>It is not possible at this stage of the development of the Nuclear NPS to say that the development of a nuclear power station on the nominated site would not have significant adverse effects on the Outer Thames Estuary SPA as a result of impacts to water quality, through disturbance, or from habitat loss/ fragmentation.</p>

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