

Strategic Environmental Assessment

Site Specific Baseline Dungeness A

May 2010

An Environmental and Sustainability Report will be published as part of the Strategic Environmental Assessment (SEA) of the Revised NDA Strategy. It has been produced in compliance with the SEA Directive (2001/42/EC) and transposing regulations (S.I.1633, 2004).

The following pages contain specific baseline information, and maps, for the Dungeness A site. This information is used in the preparation of the Environmental and Sustainability Report. A short introduction is followed by a table containing the current baseline information, organised by sustainability headings. The final section includes information about future developments and environmental issues.

The NDA is committed to openly sharing information and making it accessible to all. In making this non-confidential environmental and sustainability information available we believe that it will provide a useful ongoing resource to the general public.

Site Specific Baseline for Dungeness A

Dungeness A

Dungeness A is located along the south coast of Britain in Kent and covers some 20 hectares immediately adjacent to Dungeness B. Electricity power generation commenced in 1965 and continued for 41 years before ceasing in 2006. The anticipated timeframe for decommissioning includes de-fuelling through the removal of fuel from the reactors until 2011, followed by the demolition and removal of most of the radioactive plant and buildings during care and maintenance preparations until 2034. Radioactive decay will then be allowed to take place during care and maintenance until 2102. The last stage will begin in 2102 with the final decommissioning of the remaining reactor structures due for completion by 2111.

Site End State Assumption

The preferred end state for Dungeness A is for the site to be decommissioned through the clearance of all structures, including all those to at least 1 metre below ground level, possibly up to all structures below ground level, with any voids back-filled with shingle. Any waste will be appropriately treated, packaged and sent for permanent disposal off-site. The site will be delicensed and may be returned to a shingle foreland for nature conservation or made available for redevelopment.

Current Environmental Baseline

Table 5: Baseline Data across all topics for Dungeness A

SEA Objective	Key Environmental Baseline	Source
Air Quality	<p>Dungeness A is located within the Shepway District. Shepway District Council monitors air quality at a number of locations. The nearest monitoring location is situated approximately 8 km to the north of the operational site, at New Romney. Levels of pollutants are all within the air quality objectives limits and as such no Air Quality Management Area (AQMA) has been declared.</p> <p>Some activities on the Dungeness A site result in modest emissions of non-radioactive pollutants (including NO₂, SO₂ and PM₁₀), notably the package boiler, diesel generators and a solid Low Level Active Waste incinerator. The Low Level Activity Waste incinerator is subject to Integrated Pollution Prevention and Control (IPPC) requirements and operates within the permitted emission limits.</p> <p>Results from Environment Agency returns for the calendar year 2009 highlighted that some 3.91 10⁻⁵ TBq of beta radioactivity was discharged to the atmosphere, approximately 7% of the annual discharge limit. In addition, 0.0238 TBq of tritium and 3.01 10⁻⁴ TBq of carbon-14 were discharged to the atmosphere. This was equivalent to 0.92% and less than 0.1% of their respective annual discharge limits. Furthermore, there was a discharge of 9.87 10⁻⁵ TBq of sulphur-35, amounting to less than 0.11% of the annual discharge limit.</p>	<p>British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental Statement</i>; Environment Agency et al. (2009) <i>Radioactivity in Food and the Environment</i></p>

	<p>The resultant discharges to the atmosphere were assessed to result in doses to the critical group (a group or representative individual who receive the largest dose from artificially produced radionuclides due to their habits, diet and where they spend their time) of less than 0.006 mSv/y, or less than 1% of the public dose limit of 1 mSv/y.</p>	
<p>Global Climate Change and Energy</p>	<p>The Dungeness A site is located on a headland point along the south Kent coast shoreline. Whilst it is generally protected from severe Atlantic storms (due to the location in the east of England), it is subject to coastal erosion processes. In addition, its relatively low relief (approximately 5.8m AOD) indicate that it is likely to become increasingly vulnerable to climatic changes such as storm surges and flooding associated with the likely increased magnitude of storms and sea-level rises. At present a shingle bank provides flood defence for the site, although this is continually eroded and requires beach replenishment to be maintained.</p> <p>In 2004, when the site was operational, some 419 TJ (116.4 GWh) of energy was used on the site, with an additional 189 m³ of diesel oil delivered. However, energy consumption has significantly reduced following the cessation of generation.</p> <p>In 2007, approximately 3,500 tonnes of CO₂ was emitted directly and indirectly from activities at Dungeness A largely as a result of the consumption of 95 TJ of energy on the site.</p>	<p>NDA (2005) <i>EAPINS Project Questionnaire</i>;</p> <p>British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental Statement</i>, NDA (2008) <i>NSP Returns</i></p>
<p>Biodiversity, Flora and Fauna</p>	<p>Dungeness A is surrounded by relatively important habitat, influenced by the proximity of the marine environment, which includes a number of characteristics and species, and one of the few areas of the country where plant communities have not been influenced by anthropological events. Additionally, the UK's only population of Sussex Emerald Moth is present adjacent to, and within, the site.</p> <p>The importance of the area's biodiversity is reflected by the number of environmental designated sites located within the vicinity of the operational site including Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), candidate Special Area of Conservation (cSAC), a proposed Ramsar site, and a National Nature Reserve (NNR). A planning application for continued gravel extraction from within the SPA for beach replenishment is currently awaiting determination.</p> <p>An area to the north and northeast of the licensed site has been notified as part of the Dungeness, Romney Marsh and Rye Bay SSSI, which is designated principally for its nature conservation value and geological importance as the largest shingle structure in the UK and includes 2,300 ha of newly notified land including an area of the Dungeness A site.</p> <p>A generic assessment on the impacts of the radioactive discharges on wildlife from the UK's nuclear power stations concluded that the chronic dose rate guideline was not exceeded for any of the assessed marine or terrestrial organisms. Furthermore, the estimate doses to wildlife were below the level at which effects could be observed.</p> <p>The supporting figure highlights the context of the nuclear licensed site and its immediate surroundings. The area shown in the figure does not attempt to identify all potential designated sites that may be affected by activities associated with the UK Nuclear Industry LLW Strategy. Rather, it attempts to strike a balance between highlighting those sites that are in the vicinity of the nuclear licensed site between different topic themes. Hence, more expansive coverage would reduce the visibility of other designated sites (such as Scheduled Ancient Monuments which, by their nature, have significantly smaller coverage than ecological based designated areas).</p>	<p>NDA (2005) <i>EAPINS Project Questionnaire</i>;</p> <p>British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental Assessment</i>;</p> <p>Magic (2008) www.magic.gov.uk;</p> <p>Environment Agency (2002) <i>Impact Assessment of Ionising Radiation on Wildlife</i>;</p> <p>Magnox South (2008) <i>Environmental Management Plan Issue Three – Dungeness A Site</i>.</p>
<p>Landscape and Visual</p>	<p>The site is located on the largest shingle peninsula in Europe. The surrounding area is generally low-lying and flat resulting in an open landscape where views of the power station are widely visible. The site is located within the Dungeness Special Landscape Area (SLA) which is designated for its natural beauty and is considered to be of country-wide importance having been largely undisturbed for 5,000 years. Dungeness A is located adjacent to the still operational Dungeness B site. As a result of the surrounding landscape and massing of the structures, the</p>	<p>British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental</i></p>

	visibility of the site is quite prominent.	Statement, NDA (2005) EAPINS Project Questionnaire
Cultural Heritage	There are no Scheduled Ancient Monuments near the site. The Old Lighthouse and Dungeness Lighthousemen's Dwellings are Grade II listed buildings located approximately 200 m to the east of the site. The New Lighthouse is a Grade II* listed building located approximately 400 m from the site. Historical evidence suggests that the shingle promontory on which the site is built dates from after 1617. Prior to this the site was under the sea and consequently there is deemed to be nothing of archaeological interest in the vicinity.	British Nuclear Group (2005) Dungeness A Nuclear Power Station Environmental Statement; Magnox South (2008) Environmental Management Plan Issue Three – Dungeness A Site
Groundwater, Geology and Soils	<p>The site is located on non agricultural grade land consisting of made ground over gravel deposits underlain by marine sands. Approximately 1,100 m³ of soil is estimated to be contaminated with low level radioactivity.</p> <p>There is also non-radioactive contaminated land caused by hydrocarbon spills during the course of site operations, although no detailed estimates have been identified.</p> <p>The groundwater chemical status in the vicinity of Dungeness is considered to be poor in relation to the Water Framework Directive.</p>	www.magic.gov.uk ; NDA (2005) EAPINS Project Questionnaire; NDA (2007) Dungeness A 2007/08 IWS ; NDA (2008) Site Operator Input ; Environment Agency (2009) Water for life and livelihoods – River Basin Management Plan South East River Basin District
Surface Water Resources and Quality	<p>Coastal waters near the site have consistently met the EU Directive's targets on bathing water, either classified as 'good' or 'excellent'. Current surface run off from the site is collected and discharged to the English Channel after passing through various filters to improve its quality.</p> <p>Results from Environment Agency returns for the calendar year 2009 highlighted that 0.0769 TBq of tritium was emitted through liquid discharges, amounting to 0.96% of the annual discharge limit. Additionally, 0.0155 TBq of caesium-137 was released through liquid discharges amounting to 1.41% of the annual discharge limits.</p> <p>The exposure to the critical group (a group or representative individual who receives the largest dose from artificially produced radionuclides due to their habits, diet and where they spend their time) of 0.012 mSv/y, equivalent to approximately 1.2% the public dose limit of 1 mSv/y.</p> <p>In 2004, up to 323,000 m³ of water was consumed on site from the local mains supply, whilst an additional 174,000 m³ of water was sourced from a reverse osmosis plant. In 2007, Dungeness A consumed 212,933 m³ of water. This shows a significant decrease in water use following the cessation of generation.</p>	British Nuclear Group (2005) Dungeness A Nuclear Power Station Environmental Statement; NDA (2005) EAPINS Project Questionnaire; Environment Agency et al. (2009) Radioactivity in Food and the Environment

	<p>The potential ecological status of waterbodies adjacent to Dungeness is considered to be moderate in accordance with the Water Framework Directive. The chemical status of the coastal waters around Dungeness is classified as good.</p>	<p>2007; NDA (2008) <i>NSP Returns</i>; Environment Agency (2009) <i>Water for life and livelihoods – River Basin Management Plan South East River basin District</i></p>
<p>Waste</p>	<p>Due to the nature of the site and the current decommissioning activities, a large volume of radioactive waste is produced. Low Level Waste (LLW) is generally sent to the repository near Drigg, although it may be accumulated on site whilst capacity at Drigg is expanded. Combustible LLW such as oil and other materials is currently incinerated on site in the LLAW incinerator and a dissolution plant is used to reduce the volume of Intermediate Level Waste (ILW) by up to 20 times.</p> <p>It is anticipated that the decommissioning process will result in some 30,000 m³ of LLW, the majority of which will be generated during final site clearance. It is expected that once packaged, LLW will amount to some 41,000 m³.</p> <p>ILW is made passively safe in approved containers and stored on site until such a time that it may be transferred to an alternative off site disposal facility. Approximately 4,500 m³ of ILW is anticipated to be generated throughout the decommissioning process, including some 380 m³ during care and maintenance preparations. Once packaged, this is expected to amount to approximately 10,100 m³ of ILW.</p> <p>In 2007, approximately 1,500 m³ of non-hazardous waste was generated, of which 95.6% was reused or recycled. Additionally, 273 m³ of hazardous waste was generated, of which 95.4% was reused or recycled. It is anticipated that some 42,460 m³ of non-hazardous waste and an additional 5,470 m³ of hazardous waste will be generated during decommissioning care and maintenance preparations.</p>	<p>NDA (2005) <i>EAPINS Project Questionnaire</i>; NDA (2007) <i>Dungeness A 2007/08 Integrated Waste Strategy</i>; NDA (2008) <i>NSP Returns</i></p>
<p>Economy, Society and Skills</p>	<p>Dungeness A is located in a semi rural area of Kent. Within 10km radius of the operational site are a number of small rural settlements including Lydd (population 5,800) and New Romney (7,000). Employment within electricity, gas and water supply industry in Shepway is significantly higher than the average for England at 3.5% compared to 0.5%, emphasising the importance of the Dungeness sites to the local economy.</p> <p>In 2004, the Dungeness A site was estimated to have contributed £2.45 million directly to the economy through local suppliers, and an additional £11 million in wages. This is likely to have decreased as a result of the cessation of power generation in 2006 and is estimated to be approximately £4 million in wages to the local economy by 2010.</p> <p>Approximately 14% of the population of Shepway have higher qualifications equivalent to NVQ level 4/5 (e.g. a degree). This is lower than the national average of 20%. Conversely, some 35.5% of the Shepway population have no qualifications compared with 29% nationally.</p>	<p>British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental Statement</i>; NDA (2005) <i>EAPINS Project Questionnaire</i></p> <p>Office for National Statistics</p>
<p>Traffic and Transport</p>	<p>The Dungeness A site is situated in a relatively isolated part of Kent, some distance from the strategic road network. The preferred route to connect to the strategic road network is Dungeness Road towards Lydd then, the B2075 the A259 through Old Romney on to the A2070 which connects with the M20. Annual Average Daily Traffic (AADT) flows along the route vary from approximately 4,000 (close to the site) to over 80,000 vehicles (along the A roads).</p>	<p>British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental</i></p>

	In 2004, approximately, 10% of vehicle traffic on Dungeness Road was accounted for by HGVs. Prior to the cessation of power generation on site, there were between 2,400 and 3,000 vehicles per year from both Dungeness A and Dungeness B.	<i>Statement</i>
Land Use and Material Assets	<p>Immediately adjacent to Dungeness A is the Dungeness B nuclear power station. The land surrounding Dungeness A is predominantly scrub. Due to the geology of the area, and the environmental designations, there is little agricultural activity. The nearest settlements are Lydd and New Romney to the north.</p> <p>In 2004, up to 360,000 m³ of water was consumed on site from the local mains supply, whilst an additional 175,000 m³ of water was sourced from a reverse osmosis plant. In 2007, Dungeness A consumed 212,933 m³ of water.</p>	British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental Statement</i> ; NDA (2008) <i>NSP Returns</i>
Noise and Vibration	There are a number of potential receptors close to the site, such as singular or small groups of residential properties. Ambient background noise generated by the electricity generation at both Dungeness A and B varied between 42 and 86 dB(A) depending on the distance from the site, and vibration levels were also determined to be very low. It is anticipated that there may be a slight increase in noise during the immediate decommissioning works until the prolonged period of 'care and maintenance'.	British Nuclear Group (2005) <i>Dungeness A Nuclear Power Station Environmental Statement</i>
Health and Safety	<p>Due to the close proximity of Dungeness A with the Dungeness B, the Environment Agency and the Food Standards Agency assess the radiological impact of the two stations together. The critical group dose for consumption for discharges to the atmosphere has been estimated to be 0.005 mSv/y. This is less than 1% of the public dose limit. The critical group (a group or representative individual who receive the largest dose from artificially produced radionuclides due to their habits, diet and where they spend their time) dose from discharges to liquids was assessed to be 0.012 mSv/y, equivalent to 1.2% of the public dose limit.</p> <p>The maximum individual exposure to the workforce in 2007 was 0.629 mSv/y, compared to a dose limit of 20 mSv/y. Mean employee dose for this year was 0.057 mSv/y and mean contractor dose was 0.013 mSv/y. This is expected to decrease following completion of the care and maintenance preparations decommissioning phase.</p> <p>Dungeness A had no reportable RIDDOR incidents during 2007/2008. It had an Occupational Safety and Health Administration (OSHA) Total Recordable Incident Rate (TRIR) of 0 at the end of 2007/2008. The site has worked over 2000 days without a lost time accident up to May 2008.</p>	NDA (2005) <i>EAPINS Project Questionnaire</i> ; Dungeness A website (www.dungenesssite.co.uk); Environment Agency et al. (2009) <i>Radioactivity in Food and the Environment 2007</i> ; NDA (2008) <i>Annual HSSE Report 2007</i>

Future Developments

Defuelling processes at the site are ongoing. Radiological discharges have declined significantly now the site is no longer operational and are expected to continue to decline during the care and maintenance preparations, although certain decommissioning activities may result in short term increases in discharges for example as legacy wastes are retrieved and processed to make them passively safe.

It is anticipated that there will be negligible discharges from the site during the care and maintenance period. Higher radiological discharges especially those to air may be anticipated to occur during final site clearance when the reactors are dismantled, although these discharges have not been estimated in detail at this time.

During care and maintenance the remaining structures will be maintained to a level commensurate with the risk to the plant and potential hazards. Monitoring will demonstrate contamination control, verify the effectiveness of containment and ensure compliance with authorised discharge limits.

A purpose built store may be constructed on site to package and store radioactive wastes generated through decommissioning. The final site clearance will result in the store being dismantled and ILW being transferred from the site for permanent disposal. The current dissolution plant operations will further reduce the volumes of ILW stocks.

There will be a decrease in the number of jobs supported by the site during the care and maintenance period, although it is anticipated that should current levels of technology exist in the future, there will be approximately 150 jobs generated for the final site clearance in approximately 90 years' time.

Environmental Issues

The shingle beach adjacent to the site is subject to erosion which may increase as a result of the anticipated effects of climate change. This may result in an increase in the frequency of beach recharge currently undertaken.

