



# Environmental permitting of Sizewell C: consultation summary document

July 2022

We are the Environment Agency. We protect and improve the environment.

We help people and wildlife adapt to climate change and reduce its impacts, including flooding, drought, sea level rise and coastal erosion.

We improve the quality of our water, land and air by tackling pollution. We work with businesses to help them comply with environmental regulations. A healthy and diverse environment enhances people's lives and contributes to economic growth.

We can't do this alone. We work as part of the Defra group (Department for Environment, Food & Rural Affairs), with the rest of government, local councils, businesses, civil society groups and local communities to create a better place for people and wildlife.

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## Introduction

The Environment Agency is the independent environmental regulator for the nuclear industry in England. We make sure that nuclear power stations meet high standards of environmental protection.

Any company that wants to operate a nuclear power station must show that it can do the following safely and securely, whilst also protecting the environment:

- build, commission, operate and decommission the power station
- manage the radioactive waste it produces

NNB Generation Company (SZC) Limited applied to the Environment Agency for 3 environmental permits in May 2020. We have made a proposed decision about whether we should grant these permits, and if so, what conditions they should include.

These are permits are to:

- dispose of and discharge radioactive waste (radioactive substances activity permit)
- operate standby power supply systems using diesel generators (combustion activity permit)
- discharge cooling water and liquid effluent into the North Sea (water discharge activity permit)

The company has applied for these permits many years ahead of the station operating. If we grant these permits early on in the project, it will help us to positively influence the design, procurement and commissioning of the power station.

Overall, the Environment Agency's proposed decision is that we should issue all 3 permits. We consider that the limits and conditions in the permits are suitable to protect people and the environment.

We want your views on the draft permits and supporting documents to help us come to a final decision in early 2023.

## New nuclear power stations – the government's view

Energy policy, including the use of nuclear power is a matter for government. Government published an [Energy white paper: Powering our Net Zero Future](#) in 2020 that set out the need for nuclear power, among other measures, to achieve net zero by 2050.

In 2022 the Government also published the [British Energy Security Strategy](#). This states an aim that by 2050, up to a quarter of the power used in Great Britain will be from nuclear.

The Environment Agency has published its own plan [EA2025 creating a better place](#) to guide its activities.

The EA2025 plan sets out 3 main goals:

- a nation resilient to climate change
- healthy air, land and water
- green growth and a sustainable future

## Regulating nuclear power stations

The Environment Agency regulates specific environmental matters at nuclear sites in England by issuing environmental permits. These permits cover site preparation, construction, operation and decommissioning.

We also work closely with the Office for Nuclear Regulation (ONR), which regulates the safety and security aspects of nuclear sites.

The Environment Agency has split the process for assessing and permitting new nuclear power stations into 2 stages.

The first stage is the [Generic Design Assessment \(GDA\)](#), where we assess the environmental aspects of a power station design that would be relevant to any site. GDA allows us to begin scrutinising new nuclear power station designs well in advance of construction starting. This means that we can identify any potential design issues at an early stage and ask the applicant to address them. At the end of GDA, we provide a statement about the acceptability of the design.

We have previously carried out GDA on the design proposed for Sizewell C, known as EDF-Areva's UK EPR™. This design is currently under construction at Hinkley Point C in Somerset.

The first stage of GDA is followed by a site-specific stage, where we receive applications for environmental permits for a specific site. We take into account all of the work we have done during GDA, but our efforts are focused on site-specific matters.

## Environmental permits

This consultation is about our proposed decision to issue operational permits to:

- dispose of and discharge radioactive waste (radioactive substances activity permit)
- operate combustion plant, such as emergency diesel generators once the proposed site construction is complete (combustion activity permit)
- discharge cooling water and liquid effluent into the North Sea (water discharge activity permit)

NNB Generation Company (SZC) Limited will also apply for a range of environmental permits for building a nuclear power station and for relevant 'associated developments' such as workers' accommodation. They have not applied for these yet.

Find out more about [our work at Sizewell C](#).

## Other site-specific permissions

Before a future operator can build any new nuclear power station at a site, they must get all the necessary permissions from the relevant regulators.

### Planning permission

A new nuclear power station as large as Sizewell C needs a Development Consent Order (DCO) from the Secretary of State for the government department for Business, Energy and Industrial Strategy (BEIS). The Secretary of State will make a decision having received a recommendation from the Planning Inspectorate.

BEIS is also carrying out a habitats regulations assessment (HRA) for the planning permission through the DCO process. Any permission needed from the Marine Management Organisation to operate the site, for example the design and operation of the cooling water intake, will be assessed as part of the HRA for the DCO.

The Environment Agency is a consultee in this process and has provided advice throughout.

### Nuclear site licence

Any organisation that wants to carry out nuclear activities must apply to ONR for, and be granted, a nuclear site licence. They must do this before they start building a new nuclear plant. Granting a nuclear site licence is a significant step, but, on its own, it does not give an organisation permission to start nuclear-related construction. For that, they must get a regulatory permission from ONR.

## About Sizewell

The Sizewell nuclear power stations are in Suffolk, England on the North Sea coast, approximately 1.5km north-east of the town of Leiston.

Sizewell A was Sizewell's first nuclear power station. It operated from 1966 to 2006 and is being decommissioned.

Sizewell B is a pressurised water reactor, the first to be constructed in the UK. It's expected to stop generating electricity in 2035. However, it may carry on operating for a further 20 years, so the Environment Agency has assessed for a longer overlap with SZC, up until 2055.

EDF nominated Sizewell as a potential site for a new nuclear power station. EDF's new nuclear build company, NNB Generation Company (SZC) Limited, is proposing a twin reactor nuclear power station, Sizewell C, at the site.

The image below shows an aerial view of the proposed Sizewell C development.



## The UK EPR™ design

There are various types of nuclear reactors around the world, with over 440 in operation. One of the most common types is the pressurised water reactor (PWR), including the UK EPR™. It is capable of providing around 3,260 megawatts of

electricity, enough to power more than 6 million homes on average. This design is currently under construction at Hinkley Point C in Somerset.

In the reactor core, some of the uranium atoms that make up the fuel, split in a process called nuclear fission. These fissions produce energy in a continuous process called a chain reaction.

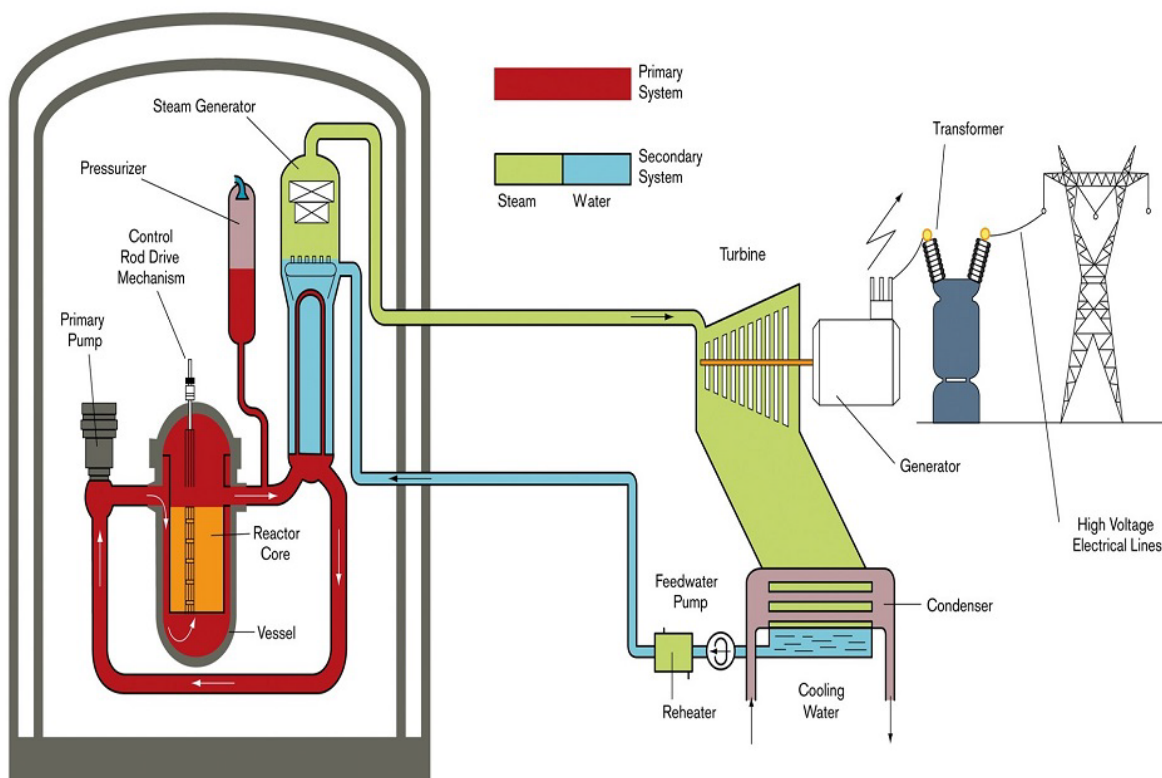
The energy created by the fissions heat water inside the reactor, which is circulated by pumps in the primary circuit to a steam generator. In the steam generator, the very hot primary circuit water is used to heat water in the separate secondary circuit. This produces steam which is fed to a turbine. This makes the turbine spin and drives a generator that produces electricity.

The primary circuit of a PWR is at a very high pressure, giving this type of reactor its name. There is a third water circuit which is used to cool the condenser of the turbine, converting the steam of the secondary circuit back to water. The water is pumped back into the secondary circuit to flow through the steam generator again.

In UK nuclear power stations, sea water is usually used in the third water circuit, but this can be replaced by water from rivers or estuaries. Alternatively, water can be cooled using cooling towers.

Find out more on [EDF's website](#).

This image shows a simplified schematic of the EPR™ reactor





For each reactor, the main nuclear support facilities include a spent fuel pool and water treatment systems for maintaining the chemistry of the primary and secondary water circuits. There are also some facilities shared by the 2 reactors, including an interim spent fuel store and an intermediate level radioactive waste store.

There are 12 stand-by diesel generators that would provide power if there was a loss of electricity from the National Grid. The diesel generators are classified as safety equipment and would only be operated during testing or in the event of a power failure.

## Our consultation on the permit applications

We publicly consulted on NNB Generation Company (SZC) Limited's 3 operational permit applications from July to October 2020.

You can view these closed consultations:

- [combustion activity permit](#)
- [radioactive substances activity permit](#)
- [water discharge activity permit](#)

We received consultation responses from members of the public, public bodies and departments, and other interested parties as follows:

- 30 for the permit to dispose of and discharge radioactive waste (radioactive substances activity permit)
- 24 for the permit to operate standby power supply systems using diesel generators (combustion activity permit)
- 27 for the permit to discharge cooling water and liquid effluent into the North Sea (water discharge activity permit)

We have been considering the relevant responses to this consultation and have been carrying out our assessments since then.

We address any relevant issues raised in our proposed decision documents (consultation documents), where we also set out our draft conclusions on NNB Generation Company (SZC) Limited's applications.

## Our proposed decision on the permit applications

We propose that we can issue permits for the 3 operational activities, as outlined in our proposed decision documents (consultation documents). The conclusions of other assessments support our view, including these 4:

- Radiological Impact Assessment
- HRA
- Countryside and Rights of Way Act (CRoW) SSSI assessment
- Water Framework Directive (WFD)

We have assessed the risks to designated habitats and species and consider that the proposed activities will not have an adverse effect on European sites, or damage Sites of Special Scientific Interest (SSSI).

## Permit conditions and limits

We consider that the limits and conditions in the permits are suitable to protect people and the wider environment. However, we would like to hear from you if you have relevant information that we may have missed in our assessments.

### Permit for managing radioactive waste

Our draft radioactive substances activity permit includes limits on gaseous and liquid discharges of radioactive waste. There are 16 requirements to provide additional information, which will help make sure that NNB Generation Company (SZC) Limited build and operate the proposed power station according to the commitments they made in their application.

### Permit for using diesel generators

Our draft combustion activity permit limits the operational hours of the generators to 500 hours a year and includes 5 pre-operational requirements and 4 improvement measures. These will help make sure that the proposed power generators are commissioned and operated according to the commitments made in the application.

### Permit for discharging water

To make sure that the environment is protected, we have included in the draft water discharge activity permit limits on temperature, total residual oxygen (TRO), hydrazine and other chemicals. We have also included limits on the quantity of fish discharged from the 2 fish recovery and return systems.

The draft permit has 18 pre-operational conditions which need the Environment Agency's approval before the proposed power station can be commissioned or begin to operate. This is to make sure it will be built, and be capable of being operated, according to the commitments made in the permit application.

## Assessing impacts on designated wildlife sites

Before making decisions about permit applications we must carry out assessments to check whether the activities carried out under an environmental permit could have an effect on designated wildlife sites. This includes carrying out a HRA on European sites and a CRoW assessment of operations that are likely to damage SSSIs.

## Protecting vulnerable habitats and species

### Habitats Regulations Assessment

A HRA is a test that we must carry out when we determine a permit for an activity that could have a significant negative effect on a European site. The activity does not need to take place within a European site to have an effect, but there must be a link, or pathway to a site, and the features within that site must be sensitive to the risks.

European sites include:

- Special Areas of Conservation (SAC) – which are designated for important high quality habitat sites and rare species
- Special Protection Areas (SPAs) – for the protection of rare and vulnerable birds
- Ramsar sites

Ramsar sites are wetlands of international importance designated under the Ramsar Convention, but it is government policy that they are given the same protection as SACs and SPAs.

The habitats and species protected by these European sites are collectively known as 'designated features'.

HRAs have 3 potential stages of assessment:

- stage 1 of an HRA is called the 'likely significant effect' (LSE) or screening stage
- stage 2 of an HRA is called an 'appropriate assessment'
- stage 3 of an HRA is called the 'derogation' stage or 'imperative reasons of over-riding public interest'

The assessment must be carried out alone and in combination with other permissions, plans and projects.

## Site of Special Scientific Interest assessment

A SSSI assessment is a test that we must carry out when we determine a permit to assess if it is likely to damage their features.

SSSIs are the finest sites for wildlife and natural features in England, supporting many rare and endangered species, habitats and natural features.

## What we looked at in our ecological assessments

For each of the 3 operational environmental permits NNB Generation Company (SZC) Limited applied for, we carried out HRA and SSSI assessments.

The main areas of potential concern we focused on included:

- radiological effects
- changes in air quality
- changes in water quality
- effects of heated water discharged from the power station
- effects on seabirds and marine mammals
- disturbance to birds

For our HRA, we assessed all these potential risks on their own and combined with the risks from other ongoing activities and planned projects in the area, including the existing Sizewell B power station.

We also considered the impact of the operation of Sizewell C in combination with its proposed construction, where enough information was available from NNB Generation Company (SZC) Limited. We will carry out further assessments when they apply for any construction environmental permits.

Annexes 1, 2 and 3 provide more detail about the HRA and SSSI assessments we carried out for the 3 permits.

## Managing radioactive waste

We considered how NNB Generation Company (SZC) Limited proposes to use best available techniques to minimise the amount of radioactive waste produced and the discharges of radioactive waste. This includes gaseous, liquid and solid radioactive waste.

Our assessment of the impact of Sizewell C's discharges on people shows that the radiation dose from Sizewell C alone (and in combination with A and B stations) is significantly less than any legal dose constraint or limit.

We have assessed the risks to designated habitats and species and consider there will be no likely significant effect on European sites or damage to SSSIs from the proposed activities.

Annex 1 describes in more detail how we have come to these proposed decisions.

## **Managing air quality**

Sizewell C would have 12 stand-by diesel generators to provide power if there was a loss of electricity from the National Grid. The main emissions to air contain sulphur, nitrogen and carbon.

We assessed the environmental impact of these emissions in 3 scenarios:

- commissioning
- routine testing
- loss of off-site power

We also assessed the impact on the local environment and people, as well as the toxic effects on vegetation and wildlife, and noise impact on birds.

We have assessed the risks to designated habitats and species and consider there will be no adverse effect on European sites or damage to SSSIs from the proposed emissions to air and noise impacts.

Annex 2 describes in more detail how we have come to these proposed decisions.

## **Managing water quality**

We will regulate the following through a water discharge activity permit:

- discharges into the sea, including cooling water, process effluent, treated sewage
- the discharge of dead or damaged fish from the fish recovery and return systems

These discharges could lead to changes in temperature, toxic effects from chemicals, and an increase in nutrients.

Our assessment considered the levels of the pollutants (chemicals, nutrients, and heat) within the area covered by the discharges against set standards.

We considered the likely effect of dead and damaged fish being discharged from the fish recovery and return system outlets on both ecology and water quality.

We have assessed the risks to designated habitats and species and consider there will not be an adverse effect on European sites or damage to SSSIs from the proposed discharges into the sea.

Annex 3 describes in more detail how we have come to these proposed decisions.

## Other assessments to support our proposed decisions

### Complying with the Water Framework Directive

We also considered whether the water discharge activities would comply with the WFD.

Some fish (such as smelt) may avoid the plume of warmer water during their sensitive breeding period, which could negatively affect the whole population.

However, risks to the estuary fish populations from the thermal discharge could be managed to make sure there is no deterioration.

This would be through:

- agreeing suitable measures to prevent or reduce damage through a Deed of Obligation in the DCO
- a robust monitoring programme which would trigger additional measures if needed

When we assessed the risk of pollution from dead and damaged fish, we found that the water quality changes would not compromise WFD compliance. We looked at how the discharges might affect the environment together with the available data on other activities and found no case for significant effects.

We therefore propose that there is minimal risk of these waterbodies being unable to meet their objectives under the WFD because of these discharges.

### Radiological impact assessment

As part of determining the radioactive substances activity permit application, we commissioned an independent assessment of the potential impact of liquid and gaseous discharges of radioactive wastes.

The assessment takes account of:

- the discharge limits proposed by NNB Generation Company (SZC) Limited
- the plant design

- site-specific factors, such as the local environment (included protected sites) and local habits information

The assessment includes an evaluation of the potential radiological doses resulting from proposed discharges from the Sizewell C site, and the Sizewell site as a whole (Sizewell A, B and C). We compared these radiological doses to relevant legal limits. We also assessed radiological doses from short-term discharge releases and to wildlife.

The results of the assessment indicate that the calculated radiological doses to members of the public from both Sizewell C and the other Sizewell sites would be well below the relevant public dose constraints and far less than the public dose limit.

Radiological dose rates to wildlife were also similarly low when compared against the relevant threshold. Therefore, there should be no radiological impact to the relevant local wildlife sites.

## Our consultation

The 12 week consultation begins on 4 July 2022 and will close on 25 September 2022.

### Your views count

We can all help to protect and improve the environment by being actively involved. Our [public participation statement](#) shows how our process is open, transparent and consultative. We would like people to understand our role, what we are doing and why it's important.

This is a public consultation, and we welcome everyone's views. We want to hear from:

- members of the public and communities (including local interest and action groups), particularly those near to the Leiston area
- elected representatives, including MPs
- local councils, especially those within a 25 mile radius of the proposed power station and other representative organisations near the site
- national non-government organisations (NGOs), campaign groups and environmental groups
- academics, scientists and consultants with an interest in nuclear power, energy production or the environment
- nuclear trade associations and professional institutions
- the nuclear industry, including potential developers and operators
- statutory consultees

- other government agencies
- other regulators
- any other organisation or public body

## Documents for public consultation

You can find details of our consultation questions and documents on [GOV.UK](https://www.gov.uk) and the Environment Agency's [online consultation webpage](#).

We have published the following documents for you to consider:

- draft permit for radioactive substances activity
- consultation document for radioactive substances activity
- draft permit for water discharge activity
- consultation document for water discharge activity
- draft permit for combustion activity
- consultation document for combustion activity
- independent dose assessment – we commissioned an independent assessment of the impact of radioactivity on members of the public, plants and animals using the proposed discharge limits
- habitat regulations assessment – covers all 3 permits
- SSSI assessment – covers all 3 permits
- Water Framework Directive assessment
- Schedule 5 legal notices specifying the further information we need from NNB Generation Company (SZC) Limited and the date by which they must provide it
- NNB Generation Company (SZC) Limited Company Manual
- relevant letters

## How to respond to the consultation

We want your comments on proposed decisions that we have made for the 3 permits needed to operate a proposed power station at Sizewell.

If you have any relevant information that you feel we have missed, you can provide your comments.

Our consultation does not relate to the UK EPR™ design. It is not about the need for nuclear power, UK energy policy, the siting of nuclear power stations, nor the safety and security of the design. Here are the aspects and issues we can and cannot take account of.

We can take account of:



- relevant environmental regulatory requirements and technical standards
- information on local population and sensitive sites
- comments on whether the right process is being used for the activity, for example, whether the technology is the right one
- the potential for the land around the site to have an effect on air quality and what pollution control may be needed
- information that we have not been made aware of in the application, or corrections to incorrect information in the application

We cannot take account of:

- issues beyond those in the relevant environmental regulations
- anything outside the remit of the Environmental Permitting Regulations, for example, the proposed location of the site, which is done by the local authority through land use planning
- whether a site should have a formal designation under the Conservation of Habitats and Species Regulations or other conservation legislation
- whether the activity should be allowed or not as a matter of principle – for example, we will not consider whether nuclear power generation is an appropriate process or whether alternative methods of generating electricity should be used instead
- land use issues or sustainability challenges, even if it is argued that changing the location of the activity would improve its environmental performance
- the impact of noise and odour from traffic travelling to and from the site
- the legally defined process we follow to determine a permit
- comments about the government's energy policy

## **There are several ways you can let us know your views**

### **Online**

Visit our [e-consultation website](#).

We have designed the online consultation to make it easy to submit responses to the questions. We would prefer you to comment online as this will help us to gather and summarise responses quickly and accurately. To do this, you will need to either log in or register a consultee account before providing your comments.

All documents are also published [on GOV.UK](#).

### **By email or letter**

You can also submit a response by email or letter.

Email: [psc@environment-agency.gov.uk](mailto:psc@environment-agency.gov.uk)

Post to:

Sizewell C Consultation  
Environment Agency  
Permit Support Centre  
Quadrant 2  
99 Parkway Avenue  
Park way Business Park  
Sheffield  
S9 4WF

## Public engagement

A programme of communications and stakeholder engagement is underway and will continue during the consultation period. This includes events with communities and stakeholders. These will be held online, by telephone or in person. They will be advertised to stakeholders at the start of the consultation.

Talk to our staff at events:

- Thursday 14 July, 2pm to 7.30pm, Saxmundham Market Hall, High Street, IP17 1AF
- Friday 15 July, 2pm to 7.30pm, Aldeburgh Parish Church, Church Hall, Victoria Road, IP15 5DU
- Saturday 16 July, 9am to 1.30pm, Leiston Community Centre, King George's Avenue, IP16 4JX

The Environment Agency will also organise online events in September. We will advertise these on [GOV.UK](https://www.gov.uk) and Twitter [@EnvAgencyAnglia](https://twitter.com/EnvAgencyAnglia).

We have deliberately made this process open, clear and consultative, subject to commercial and security sensitive constraints, because this helps to inform our decision and build confidence in us and the process.

You can [read our engagement plan for Sizewell C](#).

## Next steps

The Environment Agency will carefully consider all the relevant information we receive during and after consultation, together with existing information. We will continue to determine these permits and have not yet reached a final decision. We will then make decisions about whether we should issue permits and, if so, what conditions will be needed.

The Environment Agency will publish a summary of relevant responses made during this consultation when we release our final permits and decision documents.

We will publish our final decision documents in early 2023.

## **Annex 1: ecological assessments for radioactive substances activity permit**

### **Our assessment**

Radioactive waste is produced when the reactors are operating and being maintained. The operation of Sizewell C will result in low-level radiological emissions. The Environment Agency regulates these through a radioactive substances activity permit.

We considered the predicted impacts on the environment, including nationally and internationally important designated habitats and species

### **Radiological emissions**

The low-level radiological emissions could potentially affect the designated habitats, species, and bird populations that the European sites and SSSIs we assessed support.

We used 'reference organisms' to represent the species and habitats within the European sites and SSSIs that are up to 10km from Sizewell C. We assessed reference organisms that represent designated species and habitats found on the ground, in freshwater such as marshland, and in the sea.

### **Assessment of likely significant effects**

We know from scientific research that if the amount of radiation dose is below the agreed threshold of effect it will be of no concern.

Our assessment shows that the radioactive discharges from Sizewell C alone are well below this agreed threshold. We also looked at the combined radioactive discharges of Sizewell C and all other sources of radioactive discharges in the area, including Sizewell B. The combined radioactive discharges are also below this threshold of effect.

## **HRA conclusion**

Our proposed conclusion is that there will be no likely significant effect on the European sites within 10km of Sizewell C, therefore we did not need to carry out stage 2 of an HRA – known as an appropriate assessment.

## **SSSI assessment conclusion**

Our assessment shows that the radioactive discharges from Sizewell C are below the threshold that would result in a negative effect on species and habitats.

Our proposed conclusion is that we do not believe there will be any damage to the features of the SSSIs within 2km of Sizewell C.

## **Annex 2: ecological assessments for the combustion activity permit**

### **Our assessment**

Our assessment of the environmental impact of these emissions covers 3 operational scenarios:

- commissioning
- routine testing
- loss of electricity from the National Grid

We have assessed the long-term and short-term impacts for all 3 operational scenarios on nationally and internationally important designated habitats and species, including:

- toxic effects on vegetation from emissions of nitrous oxides (NO<sub>x</sub>) and sulphur dioxide (SO<sub>2</sub>) to the air, and an increase in nutrient levels (nutrient enrichment) and acidification through the depositing of these pollutants on the ground
- the potential for noise from the diesel generators to disturb birds

### **Air quality effects**

Our HRA and SSSI assessments considered the levels of the pollutants from the commissioning and routine testing of the diesel generators. We assessed against set standards called critical levels and critical loads. Critical levels are there to protect vegetation from emissions of NO<sub>x</sub> and SO<sub>2</sub>. Critical loads are there to protect habitats from nutrient enrichment and acidification.

These standards are on the [Air Pollution Information System website \(APIS\)](#).

We carried out these assessments at each European site within 10km of Sizewell C, and at each SSSI within 2km of Sizewell C.

We followed our guidance on assessing emissions to air and deposition to land.

Likely significant effect will not occur, if the 'process contribution (PC)' (the amount of pollutant released or deposited by Sizewell C) is less than 1% of the relevant critical level or critical load. Therefore no further assessment is needed.

If the PC is predicted to be more than 1%, we then look at the pollutant levels at the European site using the information on the APIS. Adding the background levels of pollutants to the PC gives us the 'predicted environmental concentration', or 'PEC'.

If the PEC is less than 70% of the relevant critical level or critical load there will not be an effect and no further assessment is needed.

If we found that the PC was more than 1% and the PEC was more than 70% this would mean a significant effect is likely and we would need to carry out a further assessment. This is known as stage 2, or the appropriate assessment stage, of an HRA.

We also assessed the 'short-term effects' of NO<sub>x</sub> over a period of 24 hours. If the PC is predicted to be more than 10% of the short-term critical level, we would need to do further assessment. We do not look at background levels when measuring the short-term effects of NO<sub>x</sub>.

We used these steps to identify where a detailed assessment was needed to work out if there would be damage to a SSSI.

## **Results of our assessments of air quality effects**

We found that emissions of SO<sub>2</sub> from Sizewell C are predicted to be very low, so a likely significant effect will not occur at any of the European sites within 10km of Sizewell C.

For long-term and short-term emissions of NO<sub>x</sub> we found that an appropriate assessment was needed for:

- Minsmere to Walberswick Heaths and Marshes SAC
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar
- Outer Thames Estuary SPA
- Sandlings SPA

We also carried out what is known as an 'in-combination assessment' for NO<sub>x</sub> for:

- Minsmere to Walberswick Heaths and Marshes SAC
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar
- Sandlings SPA

This was because although the PEC was less than 70% of the critical level, we wanted to make sure that other sources of NO<sub>x</sub> would not push the PEC to over 70% of the critical level by the time Sizewell C is commissioned and becomes operational. We predict that this would not happen.

For nutrient enrichment we found that an appropriate assessment was needed for:

- Minsmere to Walberswick Heaths and Marshes SAC
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar
- Outer Thames Estuary SPA

For acidification we found that an appropriate assessment was needed for:

- Minsmere to Walberswick Heaths and Marshes SAC
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar
- Outer Thames Estuary SPA

We also looked at Sizewell Marshes SSSI and Minsmere-Walbersick Heaths and Marshes SSSI (where it is outside of the SAC and SPA) as they offer extra habitat for birds from the Sizewell-Marshes SPA and Alde-Ore Estuary SPA. These SSSIs are also known as 'functionally linked land' for the SPAs.

An appropriate assessment was needed at this functionally linked land for emissions of NO<sub>x</sub>, nutrient enrichment, and acidification.

### **Appropriate assessment**

We asked the NNB Generation Company (SZC) Limited to carry out additional modelling for our appropriate assessment that would more realistically represent the way they will commission and maintain their diesel generators.

Our appropriate assessment also looked at using diesel generators during the unlikely event that operational power is lost, also known as a LOOP event. We carried this out at all sites within 10km of Sizewell C as NNB Generation Company (SZC) Limited had not assessed this in their permit application.

We looked at the contribution of NO<sub>x</sub>, nutrient enrichment, and acidification from Sizewell C at each European site identified for an appropriate assessment. We

compared this against the relevant critical levels and critical loads. We also carried out an in-combination assessment that looked at whether there were any other emissions to air or deposition that we would need to add to the PC from Sizewell C and the background levels.

There are no thresholds for an appropriate assessment. However, we would not expect there to be an adverse effect on a European site if all the contributions combined, or the PEC, are below the relevant critical level or critical load.

Where background levels are already above the relevant critical level or critical load standards, then we need to consider whether any further contributions would prevent the operators from meeting these standards in the future.

## **HRA conclusion**

Based on our assessment of the information submitted by the NNB Generation Company (SZC) Limited, our proposed conclusion is that operating the permitted combustion activity will not have an adverse effect on the European sites.

The modelling carried out by NNB Generation Company (SZC) Limited shows that any effects from the diesel generators will be close to Sizewell C and only extend over a small area of these nearest European sites:

- Minsmere to Walberswick Heaths and Marshes SAC
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar
- Outer Thames Estuary SPA and Sandlings SPA
- SSSIs considered to provide 'functionally linked land'

We looked at the potential for combined effects with other emissions to air from the construction of Sizewell C, using best available information at this time. We found that these emissions may not happen at the same time or would be so small that they could not have a combined effect on the European sites.

We were able to reach this proposed conclusion for the long-term emissions of NO<sub>x</sub>, as the critical level at the European sites will not be exceeded by the commissioning and operation of Sizewell C even when added to background levels.

For the short-term emissions of NO<sub>x</sub>, nutrient enrichment and acidification we were able to reach this proposed conclusion because of the more realistic modelling results. These showed that changes to air quality would be low-impact, too small, and for the commissioning of Sizewell C, too short-lived to result in an adverse effect on the European sites.

## **SSSI assessment conclusion**

We found that emissions of SO<sub>2</sub> from Sizewell C are predicted to be very low so we did not need a detailed assessment.

We carried out a detailed assessment of both:

- NO<sub>x</sub> from the diesel generators
- deposition of nutrient and acidification on the SSSIs within 2km of Sizewell C

Our proposed conclusion is that the emissions and deposition would not result in damage to the features of the SSSIs.

## **Disturbance to birds**

Using diesel generators at Sizewell C will create noise. We assessed whether this could result in a likely significant effect on bird populations of SPA and any Ramsar sites that protect birds within 10km of Sizewell C. We looked at whether we would need to do an appropriate assessment.

We also looked at Sizewell Marshes SSSI and Minsmere-Walbersick Heaths and Marshes SSSI (where it is outside of the SAC and SPA). They offer extra habitat for birds from the Sizewell-Marshes SPA and Alde-Ore Estuary SPA. These SSSIs are also known as 'functionally linked land' for the SPAs.

## **Assessment of likely significant effect**

For the disturbance of birds, a likely significant effect could be possible if noise levels from Sizewell C are predicted to be above background noise levels within the relevant SPA and Ramsar sites:

- Alde-Ore Estuary Ramsar
- Minsmere-Walberswick Ramsar
- Minsmere-Walberswick SPA
- Outer Thames Estuary SPA
- Sandlings SPA, Alde-Ore Estuary SPA

Modelling carried out by NNB Generation Company (Sizewell C) Limited predicted that noise levels from using the diesel generators will be at (or below) existing noise levels at the SPA and Ramsar sites. This is largely because the generators will be within concrete buildings, and they will not operate all the time.

We were able to conclude there would be no likely significant effect on the bird populations of the SPA and Ramsar sites, and on the SSSIs considered to provide 'functionally linked land'. We did not need to carry out an appropriate assessment.



## **SSSI assessment**

Our assessment shows that noise from Sizewell C is below the threshold that would result in a negative effect on birds of the following SSSIs:

- Leiston-Aldeburgh SSSI
- Minsmere-Walberswick Heaths and Marshes SSSI
- Sizewell Marshes SSSI

The proposed conclusion of is that we do not believe there will be any damage to the features of the SSSIs within 2km of Sizewell C.

## **Annex 3: ecological assessments for the water discharge activity permit**

Discharges into the sea from Sizewell C will be regulated by a water discharge activity permit. These discharges would include:

- cooling water
- process effluent
- treated sewage
- dead or damaged fish from the fish recovery and return system

These discharges could lead to changes in temperature, toxic effects from chemicals, and an increase in nutrients also known as nutrient enrichment.

## **Our assessment**

Our assessment considered the levels of the pollutants (chemicals, nutrients, and heat) against set standards within the area of the sea covered by the discharges. We considered the likely effect of dead and damaged fish being discharged from the fish recovery and return system outlets.

We thought there could be an effect on designated species and habitats if the levels of these pollutants within the sea did exceed standards.

## **Water quality effects**

We assessed the changes in water quality and effects from heated water on European sites and SSSIs.

## **Assessment of likely significant effects**

Our LSE assessment identified European sites that the:

- discharges could discharge directly into
- plume could reach

We also identified sites with species that could travel away from the designated sites to feed and could enter the discharge plume, for example sea birds and marine mammals.

We thought that the type of complex and detailed modelling submitted with the application should be used for an appropriate assessment and not an LSE screen. So for the LSE stage we only considered if there was a source-receptor-pathway link with European sites. This tells us whether there is a potential link between the discharges and designated species or habitats that are sensitive to the discharge.

Using this simple screening process, the following European sites needed an appropriate assessment:

- Alde-Ore and Butley Estuaries SAC
- Alde-Ore Estuary Ramsar
- Alde-Ore Estuary SPA
- Benacre to Easton Bavents SPA
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar
- Orfordness to Shingle Street SAC
- Outer Thames Estuary SPA
- Southern North Seas SAC
- The Wash and North Norfolk Coast SAC

### **Appropriate assessment**

Our appropriate assessment looked at whether changes in temperature, toxic effects from chemicals, or nutrient enrichment could lead to an adverse effect on the 'designated features' (protected habitats and species) of the European sites.

The discharge outlets go straight into 2 European sites, the:

- Outer Thames Estuary SPA – designated for little tern, common tern and red throated diver
- Southern North Sea SAC – designated for harbour porpoise

Little tern, common tern, sandwich tern and lesser black backed gull from other nearby sites could also feed in the area.

We examined the modelling of the changes in temperature, toxic effects from chemicals, and nutrient enrichment to check if they could affect these populations.

The distances that these birds and mammals travel to feed could mean that they are likely to come into contact with, and potentially be affected by, the area of discharge within the sea.

We also used the detailed modelling to see if the pollutants could reach other sites or if birds and mammals from more distant sites could come into contact with the discharges.

## **HRA conclusion**

Computer modelling showed that whilst the pollutants were predicted to be above the standards for the protection of the environment, these effects were localised compared to the areas the birds of Outer Thames Estuary SPA and mammals of the Southern North Sea SAC would be feeding over.

We found that it would be unlikely that the discharge plumes would reach the 'designated features' (protected habitats and species) of these European sites:

- Minsmere-Walberswick Heaths and Marshes SAC
- Minsmere-Walberswick SPA
- Minsmere-Walberswick Ramsar

For the SAC, the discharges are not predicted to reach the shoreline where the designated features are. For the SPA, the only pathway would be through the Minsmere sluice, and the models show the pollutants are not close enough to shore for this to happen.

For the remaining sites, detailed computer modelling showed that the discharges would not reach them, or the area over which their protected sea birds and marine mammals feed.

We looked at the combined impact of Sizewell C and Sizewell B operating at the same time. We also looked at the potential for other ongoing activities and planned projects in the area that could add toxic chemicals, nutrients, and heat to the sea. We were able to conclude there was no adverse effect in combination.

The proposed conclusion of our HRA is that we do not believe that there will be an adverse effect for the European sites considered in this assessment. We were able to reach this conclusion as the computer modelling results confirmed that any effects would be low-impact and small in scale.

## **SSSI assessment**

We carried out an assessment on the Alde-Ore Estuary SSSI and the Minsmere-Walberswick Heaths and Marshes SSSI as there is a potential link between the discharges and designated species or habitats that are sensitive to the pollutant.

The proposed conclusion of our SSSI assessment is that we do not believe that there will be any damage to their features. Computer modelling results confirmed that any effects would be low-impact and small in scale.

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