

Document Reference Number 100874143
Revision 01
EA-SZC-21550N

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Environment Agency
c/o The Joint Programme Office
New Reactor Programme
4S.2 Redgrave Court
Merton Road Bootle
L20 7HS

File Ref: 100874143
Unique Number: EA-SZC-21550N
Your Ref.: EPR/CB3997AD/A001

25 March 2021

For the attention of [REDACTED], **Senior Permitting Officer**

Dear [REDACTED],

**FOR INFORMATION: NNB GENERATION COMPANY (SZC) LIMITED APPLICATION FOR WATER DISCHARGE ACTIVITY
OPERATIONAL ENVIRONMENTAL PERMIT FOR SIZEWELL C – ENVIRONMENT AGENCY SCHEDULE 5 NOTICE**

Further to your Schedule 5 Notice requesting further information dated the 18th January 2021 (Application Reference: EPR/CB3997AD/A001) please find below the remaining information requested for the Sizewell C Water Discharge Activity Permit Application.

No.	EA Information Request	SZC Response
2(d)	Please provide an explanation to clarify how mortality rates within TR406 were adjusted to account for the potential for discharged fish being entrapped at SZB.	<p>TR333 Version 4 (17/03/2021) calculates the theoretical risk of re-impingement into SZB for fish discharged from the SZC Fish Recovery and Return system (0.7%). As explained in TR333 the risk is overestimated due to the assumptions in the assessment. As such the risk of re-impingement should not have been included in TR406 Version 7 (11/11/2020) as it is not proportionate to include such de minimus factors which would make no material difference to the assessment conclusions.</p> <p>However, TR406 Version 7 (11/11/2020) did include increased FRR mortality rates to account for the risk of re-impingement but the</p>

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		<p>approximate calculation used to derive the numbers in Table 6 of TR406 was not precise and the table values are too high. The true formula for FRR mortality at SZC is $(0.91 \times \text{drum screen FRR mortality}) + (0.09 \times \text{band screens FRR mortality}) + 0.91 \times (1 - \text{drum screen FRR mortality}) \times \text{re-impingement rate of } 0.7\%$</p> <p>For example, if the FRR drum screen mortality = 50% and the band screen FRR mortality = 100%, then the total FRR mortality = $0.91 \times 0.5 + 0.09 \times 1 + 0.91 \times 0.5 \times 0.007 = 0.548$. (Without taking account of re-impingement the total FRR mortality = $0.91 \times 0.5 + 0.09 \times 1 = 0.545$ i.e. re-impingement increases total mortality by 0.58%)</p> <p>The numbers in Table 6 would have given the answer FRR mortality = $0.91 \times 0.506 + 0.09 \times 1 = 0.55$ or an overestimation of 0.4% over the numerically correct value of 0.548.</p> <p>TR333 Version 4 (17/03/2021) is provided.</p>
<p>From your Appendix C report (Information for the Habitats Regulations Assessment – 100232391) and Appendix D report (WFD compliance assessment), please provide your responses to 10 (a) to 12 (e) in both formats 1.) GIS file and 2.) raw data:</p>		
10(a)	<p>Therefore, from your Appendix C report (Information for the Habitats Regulations Assessment – 100232391) and Appendix D report (WFD compliance assessment), please provide your responses to 10 (a) to 12 (e) in both formats 1.) and 2.):</p> <ul style="list-style-type: none"> • Flight lines, areas of foraging activity, locations of peak foraging and loafing, and vantage locations as shown in plates 6.1 to 6.4, and 6.6 to 6.13 inclusive. 	<p>GIS data and the majority of the raw data is not available given that the reports are from approximately ten years ago. Only raw data for Plate 6.2 and Plate 6.4 is currently available. SZC have requested the GIS data and raw data from the relevant consultancies however the information needs to be acquired from archives. SZC will keep the Environment Agency updated regarding the remaining plates.</p>
10(b)	<ul style="list-style-type: none"> • Thermal and chemical plumes as shown in plates 8.1, and 8.3 to 8.6 	<p>GIS data provided for thermal and chemical plumes (plates 8.1 and 8.3 to 8.6) are provided as part of the Schedule 5 request. The raw data was not available as the data was received</p>

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		in a modelling spatial format (NetCDF files) and then converted into GIS data (which is then used in analysis and mapping).						
10(c)	<ul style="list-style-type: none"> Breeding colony locations and predicted foraging ranges as in plates 8.1, and 8.3 to 8.8. 	GIS data provided for breeding colony locations and predicted foraging ranges (plates 8.1 and 8.3 to 8.8) are provided as part of the Schedule 5 request. Raw data provided for Plate 8.8. The raw data was not available as the data was received in a modelling spatial format (NetCDF files) and then converted into GIS data (which is then used in analysis and mapping).						
10(d)	<ul style="list-style-type: none"> The vantage locations as provided in figure 6.1 	GIS files have been provided for the vantage locations (figure 6.1) as part of the schedule 5 request. The raw data is not available because the data is just survey locations.						
10(e)	<ul style="list-style-type: none"> The thermal plumes as shown in figures 5.3 to 5.10, and chemical plumes as shown in figures 5.11 to 5.13. 	GIS data provided for thermal (figures 5.3 to 5.10) and chemical plumes (figures 5.11 to 5.13) as part of the Schedule 5 request. The raw data was not available as the data was received in a modelling spatial format (NetCDF files) and then converted into GIS data (which is then used in analysis and mapping).						
10(f)	<ul style="list-style-type: none"> From your Appendix C report (Information for the Habitats Regulations Assessment – 100232391), please confirm and provide the 'mean foraging range', and the 'mean maximum foraging range' figures for each species as given in the body of text. Please provide this information in an Excel spreadsheet format 	<p>Values provided are in relation to overlaps of predicted foraging ranges with thermal and chemical plumes for Sandwich tern, common tern and lesser black-backed gull.</p> <p>Details of the values used, and their derivation are provided in the shadow Habitat Regulations Assessment and are as follows:</p> <table border="1"> <thead> <tr> <th></th> <th>Mean Foraging Range</th> <th>Mean Maximum Foraging Range</th> </tr> </thead> <tbody> <tr> <td>Sandwich tern</td> <td>11.5 km</td> <td>32 km</td> </tr> </tbody> </table>		Mean Foraging Range	Mean Maximum Foraging Range	Sandwich tern	11.5 km	32 km
	Mean Foraging Range	Mean Maximum Foraging Range						
Sandwich tern	11.5 km	32 km						

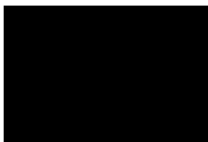
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No.	EA Information Request	SZC Response		
		Common tern	4.5 km	18.6 km
		Lesser black-backed gull	72 km	141 km
		<p>The mean maximum values from the two tern species are as determined in the Wilson et al JNCC report, whilst all other values are from Thaxter et al (2012).</p> <p>The mean values for the two tern species are taken from Thaxter et al because the Wilson et al report does not provide mean foraging range values.</p> <p>Values were taken from Thaxter et al and not from the updated foraging range estimates (Woodward et al.) because the work on determining overlaps with plumes was undertaken prior to the Woodward et al. report being formally published.</p>		

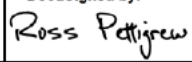
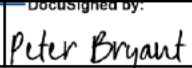
Should you have any questions or comments we will be happy to provide further information on this as part of our ongoing Level 4 interactions.

Yours sincerely,



SZC Conventional Environment Lead
NNB Generation Company (SZC) Limited

Copy: RIO, JPO, 

NNB GenCo Review	Name	Signature
Peer Check	Ross Pettigrew	<small>DocuSigned by:</small>  <small>FCE24F4AF9FA4FD...</small>
Independent Verification	N/A	
Approval	Peter Bryant	<small>DocuSigned by:</small>  <small>264897DF8BF748E...</small>

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References:

C. B. Thaxter et al. Seabird foraging ranges as a preliminary tool for identifying candidate Marine Protected Areas. Biological Conservation, 2012, 156, p. 53-61.

L. J. Wilson et al. Quantifying usage of the marine environment by terns *Sterna* sp. around their breeding colony SPAs. JNCC Report No. 500. JNCC, Peterborough, 2014, p.125.

Appendix 1

Enclosures for the Sizewell C Water Discharge Activity Permit Application Schedule 5 Information Request

	Document Title	Version Number	EDRMS Reference Number	Protective marking	Transmitted via
1.	TR333 Modelling the optimal position for a fish recovery and return outfall for Sizewell C.	001	100875244		
2.	Raw data for Plate 6.2 and Plate 6.4.	001	100873296		
3.	GIS data provided for thermal and chemical plumes and breeding colony locations and predicted foraging ranges (plates 8.1 and 8.3 to 8.6 and figures 5.11 to 5.13).	001	100873304	NOT PROTECTIVELY MARKED	Teamcenter
4.	Raw data for Plate 8.8.	001	100873307		
5.	GIS data for the vantage locations (figure 6.1).	001	100873311		
6.	GIS data provided for thermal plumes (figures 5.3 to 5.10).	001	100873314		