The Sizewell C Project

6.3 Volume 2 Main Development Site

Chapter 11 Noise and Vibration

Appendix 11D Sound Level Assessment of the Creation of Fen Meadow Compensation Areas

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SHARPS REDMORE

ACOUSTIC CONSULTANTS • Established 1990

Report

Sizewell C Project

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Sound level assessment of the creation of fen meadow compensation areas

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Sound level assessment of the creation of fen meadow compensation areas

Introduction

1 Sharps Redmore has been appointed by SZC Co. to undertake a sound level assessment for the creation of the proposed fen meadow compensation areas related to the Sizewell C Project.

2 The Benhall and Halesworth fen meadow compensation areas proposed to be created during the construction phase would be retained permanently to compensate for fen meadow permanently lost from Sizewell Marshes SSSI as a result of the development. The Benhall and Halesworth fen meadow compensation areas proposed are illustrated in **Chapter 1**, **Figures 1.4** and **1.5** of this volume.

3 The creation of the new fen meadow areas, as described in **Chapter 3** of this volume, is anticipated to require very little mobile or other plant and therefore there will be very few sources of noise during these works. Sharps Redmore has reviewed the proposed fen meadow compensation areas, nearby residential receptors and undertaken a sound level assessment as described in this appendix.

Description of the fen meadow areas proposed

4 The compensation areas would provide new lowland fen meadow habitat, including modified landforms to raise water levels, where necessary, new minor watercourses and associated planting. Further assessment, which is ongoing, includes the use of groundwater and surface water monitoring as well as a range of other surveys, to determine the detailed proposals for each site, including the need for any engineering operations to modify existing landforms, soils and raise water levels where necessary. Any such works are likely to involve a small amount of equipment, such as a single excavator.

5 It is understood that works to create these new fen meadow areas would commence at the outset of the project construction phase and include the following general processes:

- Installation of water control structures;
- Limited excavation to reduce ground levels and create minor water courses; and
- Planting of soft landscaping.

6 Sharps Redmore has reviewed the details provided by SZC Co. and determined that in terms of sound sources, only excavator activity requires consideration with respect to any residential receptors in the vicinity of the fen areas.

Assessment Methodology and Criteria

7 The noise assessment criteria throughout the project have been established in terms of low, minor, moderate and major magnitude of impacts. The full description of the derivation of assessment methodologies and criteria for the Sizewell C Project noise and vibration assessment is included in **Volume 1**, **Appendix 6G** of this ES). A medium impact from noise to a medium sensitivity receptor represents a moderate, and therefore significant impact in terms of this Environmental Impact Assessment.

8 The construction related noise criteria to residential receptors (medium sensitivity) as adopted for this assessment are based upon the ABC methodology within BS 5228-1. It is assumed that construction work would take place only between 07:00 and 19:00 hours on Monday to Friday or between 07:00 and 13:00 hours on Saturdays. In the circumstances, the magnitudes of impact for construction noise would occur when values in **Table 1** below are exceeded.

Table 1 Values to assess the magnitude of noise impact for construction at dwellings for anticipated hours of work (all values are free field)

Period	Magnitude of impact				Parameter
	Very low	Low	Medium	High	
Day	Below baseline values	Baseline noise levels	>62(1)	>72(1)	$L_{Aeq, 12h}$,dB

(1) Note: Façade values of 65 and 75dB have been converted to the equivalent free field values here by subtracting 3dB

9 At a medium sensitivity receptor when a medium or high magnitude of impact occurs, this would produce a moderate effect or major effect and this would be signficant if it occurs for a duration in excess of those stated below.

10 A significant effect is deemed to occur where the relevant criteria are exceeded for the following periods of time:

- 10 or more days or nights in any 15 consecutive days or nights; or
- a total number of days or nights exceeding 40 in any 6 consecutive months.

Receptors

11 Residential receptors and their distances from the edges of both the proposed Benhall and Halesworth fen meadow compensation areas have been identified. These are illustrated on the maps attached at the end of this appendix (**Figures 1** and **2**).

12 Potential impacts are assessed for five residential receptors around the Benhall site, and the nearest residential receptor for the Halesworth site.

Sound Level Assessment

13 For the purposes of the assessment, Sharps Redmore has assumed, on a precautionary basis, that there may be some excavator activity close to the fen meadow site boundaries at both sites. It is likely however that the excavator would not work in any specific area for more than a day or two before moving to the next area, typically moving further away from a given receptor location. The assessment presented therefore represents a worst case and temporary noise exposure at receptor locations (subject to a detailed landscaping plan being developed).

14 For all the residential receptor locations, a low existing ambient sound level has been assumed, and therefore the lower (Category A) threshold of significance (more strict) has been applied to both Benhall and Halesworth receptors.

15 It is assumed that only one tracked excavator would be required, and this has therefore been assessed. A sound power level (L_W) at the upper end of the range within BS 5228-1 has been adopted for a tracked excavator, L_{WA} = 108dB. Adopting this value allows some flexibility, should for example a small dump truck or similar prove to be required to move any site material.

16 It is assumed that there would be no need for works to be undertaken outside the period 07:00 to 19:00 hours on Monday to Friday, and between 07:00 and 13:00 hours on a Saturday. It is not considered likely that the excavator operator would undertake a continuous 12 hour period of work, and therefore a 75% 'On-time' has been assumed within the working period to allow for rest breaks and other tasks the operator may undertake.

17 Temporarily sound levels could therefore be relatively high, and the excavator activity noticeable against the existing sound climate if works were to take place at the very edge of the fen meadow sites. This is considered unlikely however, and the detailed landscape plan may well demonstrate that excavator work would actually take place at distances greater than those considered in this assessment.

18 No substantial earthworks are understood to be required at any one position within the proposed fen meadow sites, and therefore in practice the excavator is likely to operate at its closest position to each receptor for no more than a day or two.

19 At each receptor location, the predicted sound level ($L_{Aeq,12hour,free\text{-}field}$) has been calculated from the sound power level of the excavator using formula $L_p = L_W$-20*Logr-8. Adjustments have then been made for a downwind (+ve wind vector) for distances of 50 metres or more. Soft ground attenuation has also been applied using the equation within BS 5228-1 (5*Logr-7). Finally, the on-time correction has been made using the formula 10*Log(on-time/12hours).

20 The derivation of the predicted sound level ($L_{Aeq,12hour,free\text{-}field}$) to each receptor has been tabulated and is provided as **Figure 3** at the end of this Technical Note. These predicted sound levels (worst case) are summarised in **Table 2**:

Table 2 Summary of (worst case) predicted sound levels from fen meadow compensation areas and magnitude of effect

Site	Receptor	Distance from edge of site (m)	Predicted sound level $L_{Aeq,12hour,free-field}$	Magnitude of impact
Benhall	Honey Pot Cottage, Watering End & Manor House Farm	Approx. 30m	69dB	Medium
Benhall	Whitworth	Approx. 50m	65dB	Medium
Benhall	Willow Tye	Approx. 70m	61dB	Low
Halesworth	Bramfield Road	Approx. 100m	58dB	Low

21 These predicted sound levels (worst case, closest position) from landscaping activities at the fen meadow compensation areas have then been compared with the assessment criteria as set out in **Table 1.**

22 High levels of noise from the proposed fen meadow works would not exceed 10 or more days of working in any 15 consecutive days, or a total number of days exceeding 40 in any of 6 consecutive months within close proximities of receptors and therefore there would be no significant adverse noise effects.

Assessment Conclusions

23 Sharps Redmore has undertaken an assessment of sound levels from works to the proposed fen meadow compensation areas proposed at Benhall, and Halesworth in Suffolk.

24 The assessment has considered a worst case scenario, where an excavator may have to undertake some earth moving at the site boundaries and therefore at the closest positions to residential receptors.

25 Works involving the excavator would be undertaken within daytime periods only (07:00 to 19:00 hours) on Monday to Friday, and for the period (07:00 to 13:00 hours) on Saturdays only.

26 For a few days there is the potential for noise levels from works to be medium in magnitude, but the very short duration of those works is such that they would not result in a significant impact from noise.

27 For both the Benhall and Halesworth fen meadow areas proposed, works beyond 70m of receptors would result in sound levels below 60dB $L_{Aeq,12hours}$ and therefore a negligible or minor impact.

28 Mitigation measures, as set out in the **CoCP**, could be considered at the Benhall site to reduce levels as far as reasonably practicable bearing in mind the short term nature of the noise exposure.

29 At the Halesworth site, all receptors are 100 metres or further from the fen meadow compensation area boundary, and predicted levels from excavator landscaping work would be below the threshold of a significant noise impact. No noise mitigation measures are therefore considered necessary at this site.

Attachments:

Figure 1. Benhall fen meadow compensation area and residential receptors

Figure 2. Halesworth fen meadow compensation area and residential receptors

Figure 3. Derivation of Predicted sound level ($L_{Aeq,12hour,free\text{-}field}$) to each receptor

Figure 1: Benhall fen meadow compensation area and residential receptors

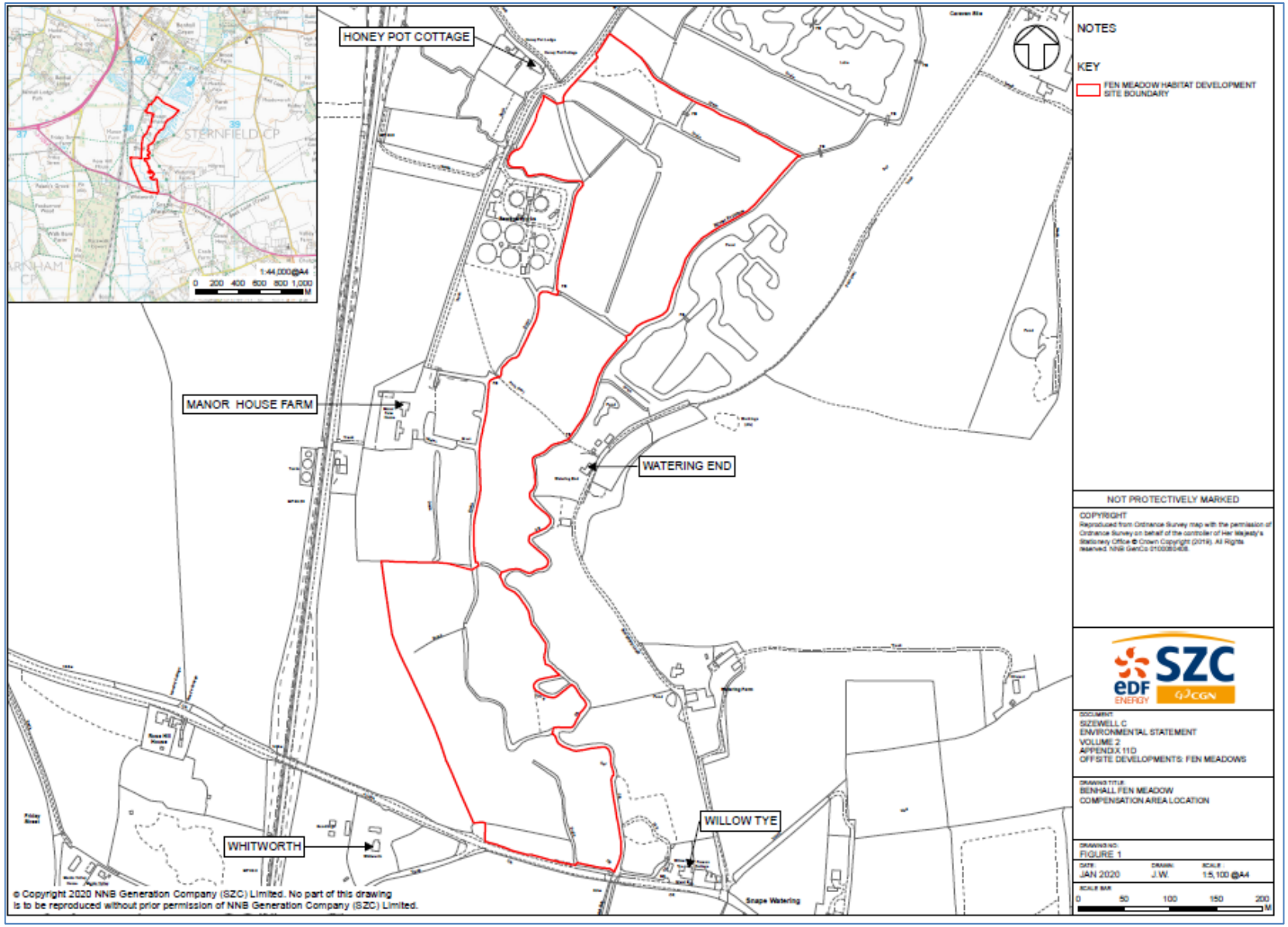

Figure 2: Halesworth fen meadow compensation area and residential receptor

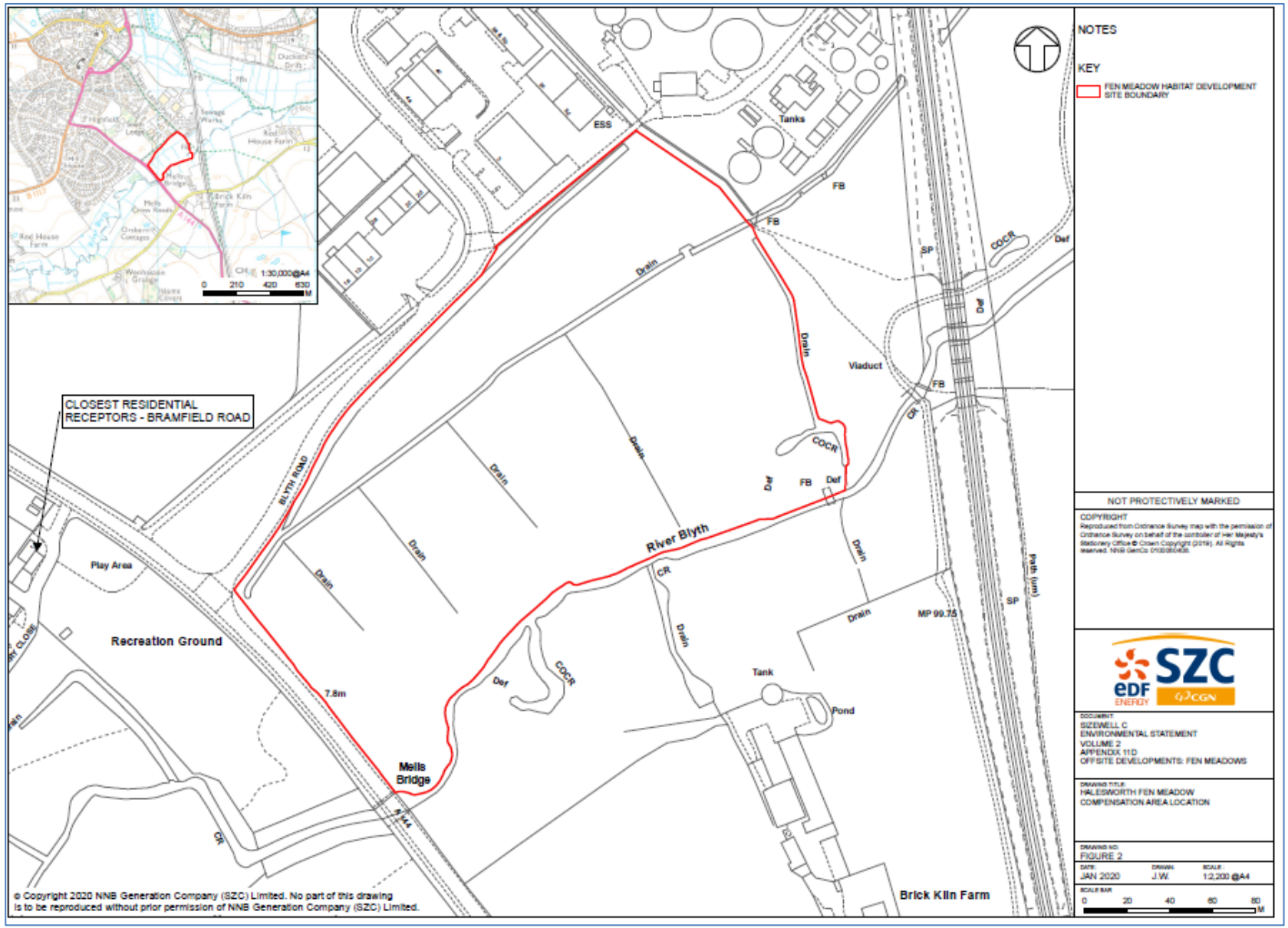

Figure 3: Derivation of Predicted sound level ($L_{Aeq,12hour,free-field}$) to each receptor

Site	Receptor	Distance from edge of site (m)	L_{WA} of excavator dB	Distance Attenuation dB	Downwind adjustment dB	Ground Attenuation dB	On-time correction dB	Resultant sound level, $L_{Aeq,12hours,\ free-field}$ dB
Benhall	Honey Pot Cottage, Watering End & Manor House Farm	30m	108 dB	-38 dB	n/a	n/a	-1 dB	**69 dB**
Benhall	Whitworth	50m	108 dB	-42 dB	+1 dB	-1 dB	-1 dB	**65 dB**
Benhall	Willow Tye	70m	108 dB	-45 dB	+1 dB	-2 dB	-1 dB	**61 dB**
Halesworth	Bramfield Road	100m	108 dB	-48 dB	+2 dB	-3 dB	-1 dB	**58 dB**