# Sizewell C Development Consent Order ('DCO') Application

# Woodbridge Town Council (IP20025891) – Deadline 2 submission on Change 1 documents

# Review of Railway Freight Transport with specific reference Viability, Noise and Vibration impact in Woodbridge

## Executive Summary (790 words)

A. This report reviews the Change 1 proposal viability and then considers evidence related to night-time train movements, specifically the movements through the town of Woodbridge, the conservation area it passes through and the RAMSAR and SPA areas it closely borders in the vicinity of Woodbridge and Melton. Several of the report's findings impact on the evidence presented by the Applicant for the towns and parishes along the East Suffolk line, specifically Melton, Campsea Ashe and Saxmundham. The report then reviews the former promises delivered Suffolk County Council ('SCC') and Network Rail ('NR') to deal with Sizewell C rail traffic and increased use of passenger services, specifically dualling, and then considers the advantages to NNBG CL and the communities along the line in East Suffolk of dualling the single-track section between Lime Kiln Quay Woodbridge and Saxmundham.

B. This report advises where evidence is absent or to be neither robust nor reliable and where the Applicant has failed to take heed of the latest international guidance on acceptable levels of night-time noise.

C. It recommends revision of the acceptable noise levels, incorporation of the impact of inevitable occasional delays that will occur at line signals, the impact of train klaxons. This in turn will require revisiting of the proposed mitigation.

D. The report proposed a known option to the current rail freight proposal implementing dualling proposals that both SCC and NR have publicly pledged to undertake in publications available in the mid 2010's to meet line needs for Sizewell C freight and pre COVID rapidly increasing passenger numbers.

E. Without such implementation prior to use by Sizewell C rail freight use the public pledges will be broken and dualling will be unlikely implemented in time to prevent adverse impact on intended passengers of the line.

F. The report specifically highlights the following:

- the non-viability of the approved Change 1 revised rail freight management strategy

- the lack of any resilience for rail freight movements even at the currently unapplied for Applicant's revision to the Change 1 strategy

- failure to take account of the signal control of the single line working for down trains to Saxmundham – specifically the need for trains to stop and start at Woodbridge station when a red light show.

- The associated impact on noise isochrons plots which assume a continuous path at 10mph through Woodbridge.

- The presence of signals on the upline at Woodbridge which control the line through to the next signal just east of the Felixstowe branch of the East Suffolk line.

- The associated risks of up trains being held at these signals and the impact on all vehicular access including emergency services to residential, commercial and the Grade 1 listed Tide Mill.

- The presence of a pedestrian and agricultural vehicle crossing with no audio or visual crossing warning systems to such traffic of approaching trains.

- The associated risk and the impact of train klaxons frequently used by trains approaching this crossing on noise levels and thereby localised noise isochron plot.

- The use of train klaxons as additional warnings at all other crossings when transgressions or driver anticipated risk of possible transgression of the crossing controls occur.

- The erroneous assertion that there are no properties in Woodbridge where people sleep within 5m of the line.

- The noise and ground borne survey was undertaken on an atypical section of line outside the main urban area of Woodbridge and the potential impact on the reliability of that survey.

- The adoption of guidance for mitigation principles and noise reduction achievement levels from guidance for new build particularly as numerous residences are not of modern construction or are maritime craft which are not considered in reference documents.

- The illogical reason for failing to heed the latest international guidance by the World Health Organisation on its strongly recommended maximum average environmental noise levels for night-time train traffic in Europe based on worldwide research on the health impacts of exceedance of those levels.

- The absence of any assessment of the impact of noise generated by night-time train on the Deben Estuary RAMSAR and SPA in close proximity to the East Suffolk line.

G. The report recommends that ExA require, if they approve the application, that NNBG CL and Network Rail pledge to implement dualling prior to use by Sizewell C freight traffic.

H. In the absence of such a recommendation by the ExA the report asks the ExA to require that the Applicant to apply for a further change that presents a truly viable rail freight strategy and resubmit its evidence reflecting the impact of the matters raised on its noise assessment and review its proposed mitigation measures to achieve the latest strongly recommended internationally proposed maximum night average noise levels for night-time train operation published by WHO in 2018.

## Introduction

1. This document is a review of the evidence submitted by the Applicant, originally named Sizewell C Co Ltd and now named as NNB Generation Company (SZC) Ltd[1] ('NNBG CL'), for its DCO Application to gain planning approval to construct and operate a new nuclear power facility in Sizewell, Suffolk, named Sizewell C ('SzC'). For clarity NNBG CL is used throughout.

2. As a Nationally Significant Infrastructure Project ('NSIP') the examination of the application is by the England and Wales Planning Inspectorate ('PINS') Examination Authority ('ExA') – a group of Planning Inspectors appointed to review the project.

3. This report firstly reviews the Change 1 proposal viability and then considers evidence related to night-time train movements, specifically the movements through the town of Woodbridge, the conservation area it passes through and the RAMSAR and SPA areas it closely borders in the vicinity of Woodbridge and Melton. Several of the report's findings impact on the evidence presented by NNBG CL for the towns and parishes along the East Suffolk line, specifically Melton, Campsea Ashe and Saxmundham. The report then reviews the former promises delivered Suffolk County Council ('SCC') and Network Rail to deal with Sizewell C rail traffic and increased use of passenger services, specifically dualling, and then considers the advantages to NNBG CL and the communities along the line in East Suffolk of dualling the single-track section between Lime Kiln Quay Woodbridge and Saxmundham.

## Background

4. The proposed main development site sits to the north of the current Sizewell B ('SzB') power station and south of Minsmere Sluice with associated facilities to the east and north-east of the main development site.

5. NNBG CL is proposing to supply the site with materials, equipment and other goods via the use of road, rail and sea. In its initial DCO Application in July 2010 it sought to use roads and rail as the main supply routes with limited sea supply. This did not find favour with many Interested Parties and in November and December 2020 NNBG CL undertook further consultation. NNBG CL proposed alongside other material amendments a significant revised supply arrangement. After the consultation this revised supply arrangement has been submitted by NNBG CL to PINS for acceptance as part of the DCO application. The change has been accepted by the ExA.

6. The change results in a greater emphasis on rail and sea supply. With regard to rail, it increases the number of night-time freight trains (2300 – 0700) along the East Suffolk line between Ipswich and Saxmundham. The original rail

[1] The Sizewell C Project | National Infrastructure Planning (planninginspectorate.gov.uk)

proposal was in "early"[2] years 4 train passages/night and in "later"[3] years 5. The Change 1 proposal is 9 train movements in "later" years with the possibility of 10. NNBG CL did not exclude the possibility of 8 night-time train movements[4] or even more as there is reference to a fifth construction train and an assumption that these could be accommodated during the day.

7. WTC understand that NNBG CL is now considering dropping the passages to 7 train movements a night and one train movement is possible during the day but it has not applied for a further Change to its DCO application. Thus, this report considers the Change 1 proposals. Change 1 also refers[5] to NNBG CL also seeking use of the line for 6 days/week rather than the originally proposed 5 days/week.

**Viability of Change 1 Proposal**

8. NNBG CL's Change 1 proposals in our view are unviable without dualling of the single line section of the track as prosed by many Interested Parties. With the single line section between Lime Kiln Quay Woodbridge and Saxmundham and the intended speed limitations, it is a flight of fancy even assuming the rail network passenger and freight trains work like clockwork with no delays over extended periods of time, it is unachievable.

9. The window of time for freight trains to use the single-track section between Lime Kiln Quay Woodbridge and Saxmundham, assuming no late running of the 2212 (last) down train to Saxmundham, is roughly 2300 to 0520, allowing for an upline freight train to clear Woodbridge to permit the 0612 first passenger train to leave Saxmundham on time. This is a period of some 380 minutes. Each freight train passage takes approximately 50 minutes between signals at either end of the single-track section. Simple mathematics shows that 9 passages a night requires 450 minutes.

10. Even in NNBG CL unapplied alteration to Change 1, a total of 7 freight train passages at night requires 350 minutes. That only leaves 30 minutes 'float' time. That float can be markedly, or completely, eaten up by the 2212 ex Ipswich being delayed awaiting East Suffolk Line passengers off a delayed 2100 ex Liverpool Street train. As a former Woodbridge - London commuter I know that to be a fairly common occurrence, by which my recollection is on average 2-3 times a month.

11. All the above assumes no engineering train use which is clearly not feasible as the line will as a minimum require the usual survey trains to monitor track quality and alignment, tamping and ballast regulation to maintain the track

[2] Before the rail extension route at Leiston opens
[3] After the rail extension route at Leiston opens
[4] §5.1.4 of Document C (refer §16 of this report)
[5] §5.1.6 of Document C

geometry within permitted limits and possible grind profiling of the railhead to maintain ride quality.

12. It also assumes there are no breakdowns, broken rails, signal failures or, derailments over more than 10 years which is highly unlikely.

13. The Change 1 proposal, or even the unapplied for variation, has little or no resilience as single line working means that any failure along that section closes the line down until repair or any obstruction is removed. WTC believes 'Thunderbird'[6] trains may be severely delayed for downline trains having to travel from Norwich via Lowestoft to connect to a defective traction unit. The above will all impact on freight arrival and at the peak movements of rail freight there is no timetable slack to recovery lost paths.

14. For all the above reasons WTC considers adoption of Change 1 proposals for rail freight is not viable with maintaining the passenger service and some diversion of rail freight to road is likely if pathways for trains are lost due to breakdowns or track/signal failures.

15. WTC presume that the projected volume of freight in and out of the site being delivered by rail in the accepted Change 1 is thus not going to be achievable. NNBG CL should thus be requested by the ExA to revisit its projected split of freight transport between road, rail and marine as WTC suspect that not even NNBG CL, now consider that it can attain 40% of freight movement by rail.

**NNBG CL's DCO Documents with regard to noise ('Evidence')**

16. NNBG CL submitted in its original DCO application reports on noise from the proposed development and specifically the following two documents:
    - Book 6.10 Volume 9 Rail Chapter 4 Noise and Vibration, May 2020 (referred to hereafter as Document A)
    - Book 6.10 Volume 9 Rail Chapter 4 Noise and Vibration, Appendices 4A - 4B May 2020 (referred to hereafter as Document B)

17. In January 2021 it submitted two further documents which were published on 22 January 2021 by PINS:
    - Book 6.14 Environmental Statement Addendum Volume 3: Environmental Statement Addendum Appendices Chapter 9 Rail Appendices 9.3 A-E Noise and Vibration Part 1 of 2 (referred to hereafter as Document C)
    - Book 6.14 Environmental Statement Addendum Volume 3: Environmental Statement Addendum Appendices Chapter 9 Rail Appendices 9.3 E Draft Rail Noise Mitigation Strategy (referred to hereafter as Document D)

[6] The name ascribed to traction units specifically designed for recovery of broken down traction units

18. It our understanding that the latter strategy is still under review with Suffolk County Council and East Suffolk Council ('ESC'). NNBG CL, or any of its constituent and shareholder companies, has recently agreed to engage with Woodbridge Town Council about the former's road and rail freight strategy and its impact and that discussion commenced on 26 April 2021.

**Review**

19. The evidence provided by NNBG CL in the reports cited above make certain specific assumptions which underlie its analysis. NNBG CL modelled, in plan, noise isochrons[7] of the proposed freight trains based on its assumptions and proposals in the initial DCO application document, Document B. These appear to have been reproduced unaltered in Document C.

20. The recent Document C include noise and vibration surveys. The recorded noise and vibration values are compared to its assumptions in the initial DCO documents. The analysis of impact on those living in the vicinity of the East Suffolk railway line has been assessed in relation to specific adopted limits of noise derived by NNBG CL consultants. We comment on those adopted allowable limits in section B Airborne maximum noise levels.

21. The conclusions in the latest report, Document D, rely on the assumptions and adopted maximum noise levels.

22. This review assesses if certain assumptions are valid, whether all train generated noise sources have been considered and whether the adopted maximum noise levels are in line with the most recent published international and national guidance and research.

*A. Evidence Assumptions*

23. Each subsection below details assumptions that are erroneous. They summarise the impact that those erroneous assumptions have on the assessment and conclusions NNBG CL has made.

*i. Down trains travelling through Woodbridge Station*

24. All reports referred to under NNBG CL's DCO documents ('Evidence') section above, make a fundamental assumption that freight trains will be able to pass thorough Woodbridge station without halting. There is only reference in Appendix 4B of Document B to trains having to stop at Saxmundham (§1.3.1). This is incorrect.

25. Until recently the driver of all down trains, those travelling towards Saxmundham, manually operated a plunger at the northern end of the down

[7] Lines of equal noise level away from a source of noise

platform to enable the train to proceed. This has now been altered to a system that does not require such operation but there remains a line signal at the down end of the platform that will not change from red if a train is moving upline towards Woodbridge. This is a fundamental feature of the single-track line which commences north of the station and just south of the Lime Kiln Quay level crossing.

26. We are currently uncertain if the signal remains driver controlled or whether it is operated remotely or whether drivers are required to slow on approach awaiting a change in the signal.

27. NNBG CL, in relation to a similar situation in Saxmundham, states in §1.3.2 of Appendix 4B, Document B that 'These train stops and starts (pulling away under load) would result in higher noise levels for people living nearby since they require the train to pull away underload twice where otherwise it might move at a slow steady speed and therefore would produce less noise'. The same will apply at Woodbridge if a train is required to stop at a red signal or if driver are required to slow approaching the line signal.

28. Over the projected period of night-time freight train operation there will inevitably be times when the uptrain has not cleared the single line section of track and trains will have to halt at Woodbridge station.

29. The assumption that all down trains will be able to pass through Woodbridge at a constant 10mph is thus erroneous. This means that the noise dB(A) $L_{Aeq}$ and $L_{Amax}$ isochron plots in Documents B and C are the best-case scenario and underestimates the impact of rail noise on residential properties, commercial accommodation, the RAMSAR and SPA areas in close proximity to the railway line through Woodbridge and Melton when trains have to stop or slow on entry to Woodbridge station.

30. NNBG CL has stated that it will run trains through Woodbridge at a constant speed of no greater than 10mph. The traction unit has thus been assumed by NNBG CL to not be under load through Woodbridge. NNBG CL's August 2010 noise measurements of the proposed Class 66/68 traction unit at that speed show a $L_{Amax}$ level[8] of 74 –76dB(A) 10m from the track. For any down trains stopped or slowed through Woodbridge station the traction unit will pass through the residential area north of the station under load as the train accelerates up to 10mph. NNBG CL has indicated from the August 2010 noise measurements that a Class 66 traction unit under load generates a $L_{Amax}$ level of 89dB(A) 10m from the track[9], up to one and a half magnitudes higher than when at a constant speed of 10mph.

[8] defined as the maximum noise level in a set time period, Abbreviations definitions Page ix of 2018 WHO Regional office for Europe – Environmental Noise Guidelines for the European region

[9] Table 2.11 line 2 on page 9 Document C

31. Table 1.5 of Appendix 4B, Document B states that for a Class 66 traction unit under load there is a much lower mean level of 79dB$L_{Amax}$ and 82dB$L_{Amax}$ at the upper 95% confidence limit. The reason for disparity between these values and those in the August 2010 report is unclear. The lower levels have been used for the computer-generated predicted noise isochron plots.

32. Table 1.1 of Appendix 4A, Document B gives values of source noise levels for a Class 66 traction unit idling and under load as 97dB,$L_{WA}$ and 102dB, $L_{WA}$ under load which we take to be immediately adjacent to the unit.

33. The draft noise mitigation strategy is inevitably flawed for this incorrect assumption alone.

*ii. Up trains travelling through Woodbridge Station*

34. For up trains there is a line signal at the southern end of the Woodbridge Station platform. If the signal is green, the driver will be able to pass through the station, in ideal conditions, at NNBG CL's proposed constant speed of 10mph. The driver will, however, be required to stop at the light if it is red.

35. The next line signal is some miles upline just east of Westerfield station. This signal controls line use at the junction with the Felixstowe branch of the East Suffolk line. The Felixstowe branch has substantial day and night freight traffic to and from Felixstowe Docks. Further many upline freight trains from Felixstowe do not pass through Ipswich station but cross over the East Suffolk downline to take the loop onto the Ipswich Norwich mainline west of Westerfield. Any delay at the signal to perform this manoeuvre can lead to delays of upline trains at Westerfield.

36. Further signal failures do occur and these would delay traffic at line signals which automatically turn red until the signalling issue is resolved.

37. An East Suffolk upline train from Woodbridge can thus be delayed at the line signal at Woodbridge. Whilst such incidents are infrequent, they do occur.

38. Further the upline between Woodbridge and Westerfield is upgradient for a very substantial part of its length. It passes through wooded areas. Traction unit wheel slippage and related train delay occur in late autumn and in, and, after storm conditions, trains can be halted along this stretch due to fallen trees. This also leads to a red signal at Woodbridge Station for up trains. As a regular daily commuter until 3 years ago Town Councillor Sanders know that delays of more than an hour have occurred.

39. The noise isochron plots all assume ideal conditions with a green signal on the upline. In less ideal times a red signal can occur at Woodbridge station for up trains. The impact of this is not considered by NNBG CL.

40. The impact on the noise isochrons plots submitted by NNBG CL for such delayed trains is similar. We acknowledge that delayed uptrains are infrequent.

*iii. Additional sources of airborne noise*

41. In paragraph 6.1.2 bullet point 2 of Appendix 4B Document C NNBG CL states that two rail condition sources flange squeal and wheel/joint airborne noise recorded in the August 2010 Leiston branch traction unit survey, were not observed during 2010 measurements of airborne noise at Woodbridge.

42. The 'Woodbridge' measurements were not in the dense urban area north of Woodbridge station where there is a tight horizontal curve to the track north of Woodbridge Station.

43. The measurements were in the former ESC offices unused car park area north of the urban area. The adjacent track has no horizontal track curvature. Given the disparity in the track between the measurement site and dense urban area it is unreasonable for NNBG CL to assume that these additional sources of noise will be absent when freight train wagons negotiate the tight curve north of Woodbridge station.

*A. Evidence Omissions*

*i. Train klaxons*

44. There is no assessment by NNBG CL in its DCO Application documents of the impact of train klaxons.

45. Train klaxons are frequently used by all train drivers of both up and down trains at the vehicle and pedestrian crossing at the south-east corner of Kingston Field recreation ground. The crossing has no audible and/or visual warnings of train approach for vehicle drivers or pedestrians. The crossing at Jetty Lane has been upgraded to provide audible and visual warning to those crossing the line but there is no plan for similar works at the Kingston Field crossing.

46. Klaxons are also used at crossings with audible and/or visual warning system when train drivers note the possibility of an infraction of crossing limitations by vehicles or pedestrians. This occurs fairly frequently at the crossings north of Woodbridge Station but the frequency of use at Jetty Lane, Quayside and Tide Mill Way cannot be gauged as present as the systems are new at these crossings although the latter two have had warning systems and part gates in the past. We believe the 99dB airborne measurement at the ESC car park on 5 March 2020 and 106dB on 23 September 2020 possibly reflect occasional

horn use for the purpose stated above but the proximity of the train when using the horn, to the recording equipment, is unknown.

47. NNBG CL's consultant did not attribute these readings to klaxon use. It attributed the 5 March 2020 reading to a vehicle pass but that is impossible given the location of the monitoring station, remote from any highway.

48. There are numerous readings above 95dB between 11 and 30 October 2020. These are attributed by NNBG CL to known engineering train passes. These readings exceed NNBG CL assessed noise levels for Class 66/68 traction units but there is no record of the traction unit type causing these high readings.

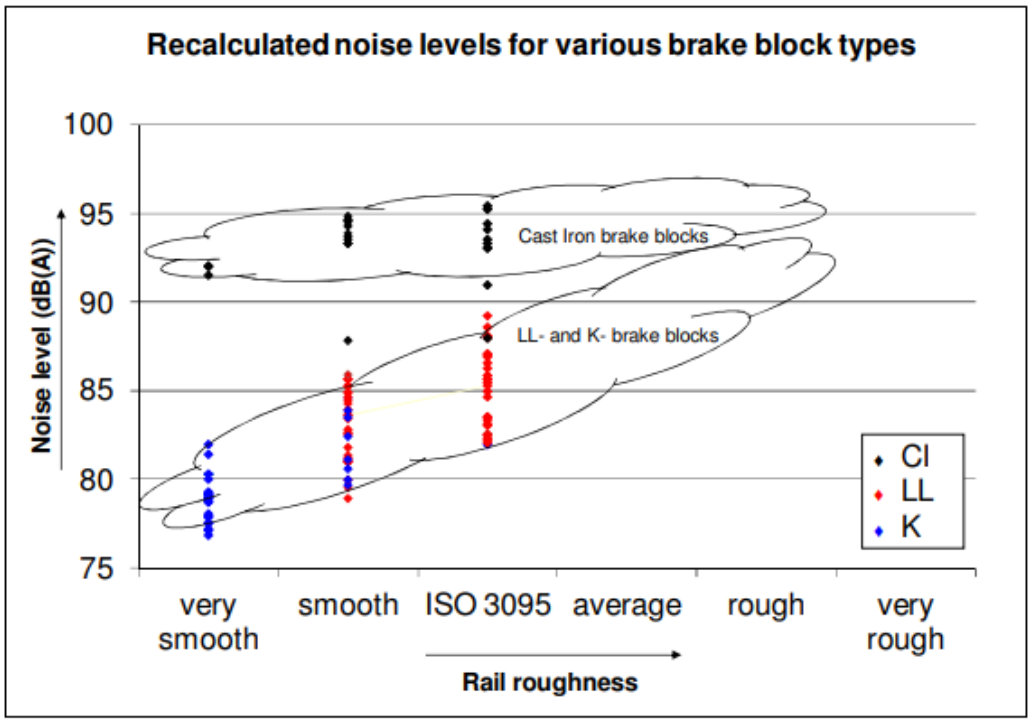
49. Train klaxons for the class of trains to be used for Sizewell C are required by the Railways Group standard GM/RT 2131 sub-section 2.2.1 (page 7) to emit sound producing, at a minimum, an equivalent to 86 – 94dB(A) at 25m distance from the track. This is over 3 magnitudes higher than a rolling 10mph Class 66 traction unit.

50. The noise isochron evidence presented by NNBG CL does not reflect the sound generated by train klaxons. This omission, given the very high sound level of the klaxons, underestimates the impact of rail traffic noise on properties and the Deben Estuary RAMSAR and SPA adjacent to the railway line through Woodbridge. The noise mitigation strategy may be impacted by this omission.

*ii. Other train noise*

51. The incorrect assumption that freight train will all proceed through Woodbridge Station at a constant speed means consideration has not been given to other train related noise generation. Noise is generated by brakes on freight wagons and this is dependent on the type of wheel and braking system. The University of Southampton's Institute of Sound and Noise Research has modelled the noise levels to lie between 82.8 and 91.3dB(A) depending on specific brake and wheel combination. The values were based on a train speed of 120km/hr assumed in the model.[10] Research by International Union of Railways UIC[11] at lower speeds, 80km/hr, show similar values and a strong impact of rail roughness on noise levels.

[10] March Southampton N+V:Layout 1.qxd (isvr.co.uk)
[11] 2013 Noise reduction by freight wagon retrofitting synthesis report update 18012013 (uic.org)




52. The above research suggests there is little relationship between train speed and braking noise levels. Thus, taking the above noise levels, the values in these papers suggest braking noise is an issue and generates noise levels significantly exceed the 77dB(A) for the traction unit at a constant speed of 10mph.

53. WTC contend modelling braking of the freight trains will impact on the noise isochron plots in NNBG CL plots in Appendices 4A - 4B of Document C for significant lengths of track either side of Woodbridge station where braking will be required (for down trains) or may be required (for up trains). The NNBG CL noise isochrons thus again underestimate the impact of the freight train on properties and the RAMSAR and SPA areas close to the railway line through Woodbridge and Melton. The noise mitigation strategy may be impacted by this omission.

iii. *Proximity of Properties affected by airborne noise*

54. In its assessment of the impact on properties adjacent to the East Suffolk railway line NNBG CL has stated in its Documents A and D that there are no properties within 5m of the line in the Woodbridge area. Further in Appendix D within Document C there are no Woodbridge properties listed to be within 5m of the line, only one Swirly Cottage on Lime Kiln Quay Road with 7m and four within 10 to 14m- 2, 6, 9 and 15 Quayside Place, 1 Tide Mill Way and 48a Deben Road. This is erroneous. Further no reference is made to any of the houseboats which lie close to the line. We understand that the occupiers of some houseboats are currently being consulted and results of that consultation are not be available at this time.

55. The Woodbridge Station Guesthouse, which is the former station building, abuts the down line platform and lies less than 3m from the edge of the track. The windows to guestrooms on the north elevation lie within 5m of the position a traction unit would stop and start under load to go downline.

56. Between the station and the quayside crossing there is a property called the Malthouse that has a large first floor window facing the track and less than 3m from it.

*B. Airborne maximum noise levels (human impact)*

*NNBG CL maximum levels*

57. NNBG CL in Table 2.1 of document C details out the impact of noise between future railway noise and existing railway noise and the following abstract of the lower part of the table is relevant to discussion later in this assessment.

| Change in Noise Level dB(A) | Subjective Response | Magnitude of Impact |
|---|---|---|
| 3.0 to 9.9 | Present and potentially intrusive, particularly at higher end of scale | Medium* |
| 10.0+ | Present and disruptive | High* |

Note: *Where the resultant noise level is below a low threshold of effect (see Table 4.7 [of the Volume 9, Chapter 4 of the ES (Doc Ref 6.10) [APP-545]]), then the effect would be negligible, irrespective of the magnitude of change.

58. We have been unable to find direct measurements of background night-time noise measurements in the reports provided by NNBG CL for the areas of housing and houseboats. There is reference in Document A In Table 4:20 on page 22 to a night-time $L_{Aeq}$ of 40dB and A90 of 33dB at Deben Road but no source reference. WTC believe the penultimate column in Table 2.1 on page 4 of Appendix B for each month within Appendix 9.3 B of Document C reasonable reflect the maximum level of background noises at the noise test location north of Deben Road. Over 75% of those values are 34dB or less. The graphs in Figures B1 – B5 for each month shows that the background noise at the noise test location is frequently below 30dB. The location is remote from inhabitation and in our view the background noise levels in the graphs are probably unrealistically low for the central inhabited area of Woodbridge at night. If one uses the 34dB values derived from Table 2.1 this is more likely to reflect true values in the central inhabited area. On that basis using these $L_{Amax}$, 5min range min, average noise levels from the proposed night-time trains which exceeding 44dB would be in the high magnitude of impact base on the Table in §57.

59. In Table 2.2 of Appendix 4B, Document C reproduced below this is equated to airborne noise levels for the new Green line and in the text, §2.25, states $L_{Amax}$ therein is also applicable to existing lines i.e. the East Suffolk line. In other words NNBG CL appears to be adopting both Laeq 8h and $L_{Amax}$ for the new line but not for the East Suffolk Line where only $L_{Amax}$ is being adopted for assessment for mitigation. This latter position was confirmed at a meeting between Woodbridge Town Council. NNBG CL stated that there was unlikely to be a broach of average 8-hour levels but WTC contend this has to be seen in the context of their assessment of the limit for those levels.

| Sensitivity of receptor | Period | Magnitude of impact (1) | | | | Parameter |
|---|---|---|---|---|---|---|
| | | Very low | Low | Medium | High | |
| High | Any | Bespoke assessment method to be used | | | | |
| Medium | Day | <50 | 50(2) | 60 | 66 | $L_{Aeq, 16h}$, dB |
| | Night | <40 | 40(2) | 55 | 59 | $L_{Aeq, 8h}$, dB |
| | | <60 | 60(2) | 70 | 77 | $L_{Amax}$, dB |
| Low | Day or night | <50 | 55(2) | 65 | 66 | $L_{Aeq, 8h}$, dB |
| Very low | Any | No assessment normally required | | | | |

Notes: (1) consideration of the scale of any changes in railway noise should also be considered, where there is existing railway noise.

(2) These are the values to use for the lowest threshold of effect referred to in Table 4.6 [of Volume 9, Chapter 4 of the ES (Doc Ref 6.10)[APP-545]] above

60. As can be seen Table 2.4 from Document C, reproduced below, NNBG CL in assessed railway noise against thresholds called the lowest observed adverse effect level (LOAEL) and the significant observed adverse effect level (SOAEL)[12]. Different level pertains to day and night time periods.

[12] NNBG CL define this as the level above which significant adverse effects on health and quality of life occur.'

**Table 2.4: Summary of criteria for airborne railway noise (all free-field values) (medium sensitivity receptors)**

| Time Period | LOAEL | EIA Significance(1) | SOAEL |
|---|---|---|---|
| Day (07:00-23:00) | 50dB $L_{Aeq,16hr}$ | 60dB $L_{Aeq,16hr}$ | 66dB $L_{Aeq,16hr}$ |
| Night (23:00-07:00) | 40dB $L_{Aeq,8hr}$ | 55dB $L_{Aeq,8hr}$ | 59dB $L_{Aeq,8hr}$ |
| | 60dB $L_{Amax}$ | 70dB $L_{Amax}$ | 77dB $L_{Amax}$ |
| Note: (1) - EIA Significance value is the moderate adverse effect threshold, which is the lowest threshold at which a significant effect is considered to occur. | | | |

61. The 2019 Ministry of Housing, Communities and Local Government Planning Practice Guidance on Noise[13] ('PPGN') which sets out detailed definitions of LOAEL and SOAEL in the main text and in the noise exposure hierarchy table[14] therein. The text quotes are followed by quotes from the associated table are given in §62 and §63 below. There is no reference to, or definition of, a EIA Significance level as adopted by NNBG CL.

62. LOAEL is

- *'The level of noise exposure above which significant adverse effects on health and quality of life occur'.*

- *'Present and intrusive',*
  *'Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.'*
  *'Observed Adverse Effect'.*
  *'Action – Mitigate and reduce to a minimum'.*

63. SOAEL is

- *'the level of noise exposure above which significant adverse effects on health and quality of life occur.*

- *'Present and disruptive'*
  *'The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for*

[13] https://www.gov.uk/guidance/noise--2

[14] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/820957/noise_exposure_hierarchy.pdf

*sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep.'*
*'Significant Observed Adverse Effect'*
*'Action – Avoid*'

64. NNBG CL selected its own level of significance called 'EIA Significance'.

65. Comparison of Table 2.2 and 2.4 reproduced above shows that the NNBG CL 'EIA Significance' values equate to medium receptors with medium impact as defined in Table 2.1. Medium receptors include residential properties.

66. This initially appears reasonable except with regard to the impact as assessed by Table 2.1 of document C, see §57 above which places such levels well into the high impact area. WTC would however point the Examiners to further international guidance which is available from the World Health Organisation ('WHO').

67. The impact of all environmental noise sources on humans including train noise, including night-time train noise, has been the subject over time to many studies by WHO. The most recent detailed study by WHO was published in a 2018 report[15] which is specific to train operations in the European Region.

68. Section 2 of this latest WHO report provides WHO's evidence base for its recommendations and Section 3.2 addresses WHO's recommendations for railway noise. It does not rely on the qualitatively assessed levels of impact used to define LOAEL or SOAEL but use where available quantitative data from research up to around 2015 to set limits on noise, specifically night-time noise from trains.

69. Table 22 in the WHO report details evidence-based assessment of impact of railway noise on sleep disturbance with confidence limits on the assessed percentage (HSD = highly sleep disturbed[16]) and is reproduced below.

Table 22. The association between exposure to railway noise ($L_{night}$) and sleep disturbance (%HSD)

| $L_{night}$ (dB) | %HSD | 95% CI |
|---|---|---|
| 40 | 2.1 | 0.79–3.48 |
| 45 | 3.7 | 1.63–5.71 |
| 50 | 6.3 | 3.12–9.37 |
| 55 | 10.4 | 5.61–15.26 |
| 60 | 17.0 | 9.48–24.37 |
| 65 | 26.3 | 15.20–37.33 |

[15] 2018 WHO Regional office for Europe – Environmental Noise Guidelines for the European region
[16] Abbreviations definitions Page ix of 2018 WHO Regional office for Europe – Environmental Noise Guidelines for the European region

70. WHO strongly recommends[17] the following:

For night noise exposure, the GDG **strongly** recommends reducing noise levels produced by railway traffic during night time below **44 dB** $L_{night}$, as railway noise above this level is associated with adverse effects on sleep.

To reduce health effects, the GDG **strongly** recommends that policy-makers implement suitable measures to reduce noise exposure from railways in the population exposed to levels above the guideline values for average and night noise exposure. There is, however, insufficient evidence to recommend one type of intervention over another.

71. The table in §69 above indicates that at the WHO's recommended maximum noise level just under 4% of people were highly sleep disturbed by railway noise at the recommended maximum level. Interestingly it equates to the level of noise that WTC contend in §58 above as a major impact if exceeded.

72. The NNBG CL's adopted dB maximum noise levels are quoted in $L_{Aeq}$ and $L_{Amax}$ whereas WHO levels are in $L_{night}$. A 2017 learned paper[18] indicates that there is less than 1dB difference between the $L_{Aeq}$ and $L_{night}$, thus for all practicable purposes the two different units can be equated to one another. We have made that assumption below.

73. Taking the NNBG CL EIA Significance maximum noise level of 55dB $L_{Aeq,8hr}$, and relating this to the table in §69, then over 10% of people would be highly sleep disturbed by railway noise at this NNBG CL recommended average maximum noise level.

74. At the NNBG CL EIA Significance maximum sound level of 70dB $L_{Amax}$, extrapolation of the table in the 2018 WHO guidelines would suggest approaching 40% of people would be highly sleep disturbed.

75. DEFRA[19] in its 2019 action plan on railway induced environmental noise states that it had yet to evaluate the 2018 WHO guidelines. In contacting DEFRA via our local MP DEFRA has responded by stating it is currently assessing the 2018 report and research that postdates that used for the WHO report to develop new guidance. However, in the past government guidance has closely followed such guidance from WHO after evaluation.

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[17] WHO defines strongly recommended on page xv of 2018 WHO Regional office for Europe – Environmental Noise Guidelines for the European region as below:
*"A strong recommendation can be adopted as policy in most situations. The guideline is based on the confidence that the desirable effects of adherence to the recommendation outweigh the undesirable consequences. The quality of evidence for a net benefit – combined with information about the values, preferences and resources – inform this recommendation, which should be implemented in most circumstances*."

[18] Conversion between noise exposure indicators Leq24h, $L_{Day}$, $L_{Evening}$, $L_{Night}$, $L_{dn}$ and $L_{den}$: Principles and practical guidance International Journal of Hygiene and Environmental Health 221(1)

[19] 2019 DEFRA Noise Action plans: Railways Environmental Noise (England) Regulations

76. DEFRA in its 2019 report states in paragraph 1.3 in relation to night-time train noise:

*"It causes sleep disturbance, annoyance and there is growing evidence that long-term exposure to high levels of environmental noise is associated with illnesses like heart attacks and strokes."*

77. WHO 2018 recommendations accord with the principles and three stated aims of the government's 2010 Noise Policy Statement for England[20]. This document also advises of the Government's intention to keep research on health effects of long-term exposure to noise under review.

78. In this case such revised guidance can be reasonably anticipated to be in place well before the use of the East Suffolk Line for Sizewell freight traffic.

79. NNBG CL have adopted a $L_{Aeq8hr}$ noise limit one magnitude higher than the equivalent strongly recommended WHO 2018 level. It is noteworthy that this WHO level ties in closely with in Figure 2 of the 2017 document 'Planning & Noise Professional Practice Guidance on Planning & Noise'[21] ('ProPG') which refers to limiting noise levels to 45 dB - see extract below

| ACTIVITY | LOCATION | 07:00 – 23:00 HRS | 23:00 – 07:00 HRS |
|---|---|---|---|
| Sleeping (daytime resting) | Bedroom | 35 dB $L_{Aeq,16\,hr}$ | 30 dB $L_{Aeq,8\,hr}$<br>45 dB $L_{Amax,F}$ (Note 4) |

*NOTE 4 Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values. In most circumstances in noise-sensitive rooms at night (e.g. bedrooms) good acoustic design can be used so that individual noise events do not normally exceed 45dB $L_{Amax,F}$ more than 10 times a night. However, where it is not reasonably practicable to achieve this guideline then the judgement of acceptability will depend not only on the maximum noise levels but also on factors such as the source, number, distribution, predictability and regularity of noise events (see Appendix A).*

80. This level equates to the WHO document 'Guidelines for Community Noise' (1999) is based on research into the effects of noise exposure on health (including sleep) and advise that effects on sleep have been observed on individuals exposed to 45dB $L_{AFmax}$ or less, and that it is important to restrict levels above this threshold as far as possible.

## Mitigation

81. The ProPG document is specifically for New Residential Development but NNBG CL has referred and utilised it within its reports.

[20] https://assets.publishing.service.gov.uk/.../pb13750-noise-policy.pdf
[21] https://www.ioa.org.uk/publications/propg

82. ProPG guidance states in paragraph 2.33

*"Most residents value the ability to open windows at will, for a variety of reasons, and LPAs[22] should therefore normally request that designers principally aim, through the use of good acoustic design, to achieve the internal noise level guidelines in noise-sensitive rooms with windows open."*

83. and in paragraph 2.36

*"Therefore, should the LPA accept a scheme is to be assessed with windows closed, but this scheme is reliant on open windows to mitigate overheating, it is also necessary to consider the potential noise impact during the overheating condition. In this case a more detailed assessment of the potential impact on occupants should be provided"*

84. ProPG states the methods contained therein, specifically the use of double glazing and ventilation systems to maintain airflow within a building structure, can reduce internal noise levels by up to 25dB from that on the façade.

85. NNBG CL has until recently stated in its mitigation strategy that mitigation will occur where façade levels are 77 dB and thus a 25dB reduction, if achievable, would reduce the internal levels to possibly as low as 52dB well above the 45dB recommendation in ProPG for those sleeping[23]. Further, the properties that will require mitigation based on a 77 dB façade level in Woodbridge are not modern buildings and achieving the theoretical maximum 25dB reduction may be difficult to achieve without substantive alterations. Whilst the footnote to the extract in §79 above allows for such a reduction not to be achieved, based on what is reasonably practicable, it does require a detailed assessment of how that judgement has been arrived at. We have not seen an assessment as to whether the noise reduction can be achieved in affected properties and, if not, the justification for not achieving it.

86. The 77dB intervention level is set well above the NNBG CL SOAEL (70dB) and WTC are aware that East Suffolk Council is strongly recommending reducing the intervention level to 70dB at the façade, the SOAEL. WTC would agree such a reduction is essential to avoid serious impact on the lives and health of residents who properties are so affected but, even at an intervention level of 70dB, as stated above the level of noise reduction recommended by ProPG may not be reasonably achievable.

87. Further even if a reduction to 45dB is achieved the magnitude of impact is high as defined by the abstract from Document C given in §57 above.

[22] Local Planning Authority
[23] See §79 of this report

88. In all of the assessment no consideration of the impact of klaxons has been made yet these, whilst not use for each train passage, generate noise levels over 3 magnitudes higher than other noise from an operating traction unit. Further the nature of the sound is very distinctive and has been the subject of complaints since new standard compliant klaxons were introduce with the new passenger trains which now operate on this line. WTC consider that the abstracts from BS8233 given in §4.37, 4.38 and 4.44 of the EIA Methodology[24] are particularly relevant in this regard. These refer to sporadic noise events requiring separate values for acceptable internal noise levels and that for low frequency content noise "lower noise limits might be appropriate."

89. The above situations relate to the $dB_{Amax}$. Should properties have façade levels that lie between the NNBG CL EIA Significance night-time 8-hour average level and the lower WHO 2018 $dB_{night}$ limit then NNBG CL should be requested to undertake what are presumably lesser mitigation measures so that they have internal noise level no higher than 44-45dB.

90. The effect of the NNBG CL current mitigation levels is to reduce the assessed impact of night-time noise insufficiently on those people attempting to sleep in properties in the vicinity of the railway line. WHO consider excessive environmental noise this will have adverse health impacts as does DEFRA[25] which states in paragraph 1.3:

*"It causes sleep disturbance, annoyance and there is growing evidence that long-term exposure to high levels of environmental noise is associated with illnesses like heart attacks and strokes."*

91. To avoid the use of WHO 2018 $dB_{night}$ limit NNBG CL has stated the following at §4.48 of its EIA Methodology.

*"The 2018 guidance has not been incorporated within any standards and nor is it referred to in policy, so although it provides an information review of evidence and thresholds for likely health effects, it is not suitable for use for predicting noise effects." Underlining by WTC*

92. With the greatest respect to NNBG CL the underlined part of the abstract section makes no logical or scientific sense. That something relatively new has not been incorporated into standards to date or into policy does not infer that the guidance is unsuitable for predicting noise effects. Standards and policy are not created overnight and take some years to be created.

[24] Book 6, Environmental Statement Volume 1 Chapter 6 EIA Methodology Appendix 6D-6Y

[25] DEFRA July 2019 Noise Action Plan: Railways Environmental Noise (England) Regulations 2006 Noise Action Plan: Railways (2019) (publishing.service.gov.uk)

**Rail induced Vibration and Induced Noise**

93. NNBG CL report 6.14 Volume 3 Chapter 9 Appendix 9.3 A-E Noise and Vibration Part 2 of 2 states in section 2.4 (page 3) that

*"where the Saxmundham to Leiston branch line passes within 15 metres of a residential property, the track bed will be further upgraded to include an under-ballast mat for a minimum distance of 10 metres either side of the property".*

94. The rationale for incorporating this improvement to limit track vibrations only along this stretch of the rail route as opposed to elsewhere where properties are within 15m of the line is not provided. If such mitigation is deemed necessary for the Saxmundham to Leiston branch line WTC believe it should also be incorporated at other locations where properties are within 15m of the track impacted to night-time freight trains.

95. NNBG CL has indicated to WTC that track bed anti vibration mats would involve substantial additional work removal of existing track bed. On the Saxmundham to Leiston branch line NNBG CL and Network Rail the latter needs refurbishing but not on the East Suffolk line. However alternative means of vibration reduction between track bed and rail exist and we consider that for parity with the Saxmundham to Leiston branch line these are incorporated through Woodbridge where properties are within 15m of the line. This was intimated as feasible to NNBG CL at its meeting with WTC.

**Impact on wildlife and ecosystems**

96. In addition to the assessment of noise on human receptors the 2019 PPGN refers to the need to consider the effect on wildlife and states

*"Noise can adversely affect wildlife and ecosystems. Particular consideration needs to be given to the potential effects of noisy development on international, national and locally designated sites of importance for biodiversity."*

97. The railway, as noted earlier, is on the boundary of the Deben Estuary RAMSAR and SPA but NNBG CL has not provided an assessment of the impact on these designated areas.

98. NNNBG CL should be requested by the Examiners to undertake an appropriate assessment and implement mitigation measures require that arise out of such a study.

**The known solution to provide resilience for freight and avoid adverse night-time impact**

99. In the light of the findings above there is much to recommend revisiting means of avoiding the impacts by a more fundamental change to the rail infrastructure such as re dualling of the line between Lime Kiln Quay Road and Saxmundham, a partial such dualling or possible two passing loops on the single-track section so that daytime freight trains can be run alongside the passenger trains.

100. There is no doubt that dualling the single-track section of the line will vastly improve the resilience of the line for Sizewell C freight train traffic providing capacity to allow recover of lost train passages due to inevitable breakdown or failures of the track, signals or traction units. For this reason alone WTC find it quite astonishing that NNBG CL has not advocated dualling ever since it considered the use of rial as a major freight transport facility particularly as both SCC and NR had proposed this approach in their future development plans.

101. Growth of passenger use of the East Suffolk line, prior to COVID, was one of the highest in the United Kingdom with a recorded 52% growth at Woodbridge and 102% at Oulton Broad South in the early 2010's as recorded at page 28 of Suffolk County Council's ('SCC') Suffolk Rail Prospectus submitted at Deadline 1 as part of the Joint Local Impact report. The prospectus was to define the rail priorities in the period 2015 – 2035.

102. Dualling between Lime Kiln Quay Road and Saxmundham is a line capacity improvement that the Suffolk Rail Prospectus identified at page 9, and detailed in the final paragraph of page 29, as a necessary requirement for Sizewell C freight train use, submitted at Deadline 1 as part of the Joint Local Impact report. The prospectus also indicates at page 29 that such improvement will also help achieve the improved journey times from Lowestoft to Ipswich which is a core strategy identified therein. The use by NNBG CL of the line for rail freight will prevent any possessions of the line for rail improvement works to be implemented as except for a night-time window once a week it will be being used 24 hours a day.

103. In SCC's Joint Local Impact Report submitted at deadline 1 Appendix 2.5 included Network Rail Anglia Route Study of March 2016. Network Rail identified on page 46 and Table 4.3 a passenger train increase to 2 trains per hour by 2043 between Ipswich and Lowestoft. On page 85 Network Rail identified that this would interact with any projects to support rail freight for

Sizewell C and require full dualling of the line between Woodbridge and Saxmundham or additional looping facilities south of Wickham market and south of Saxmundham.

104. Network Rail and NNBG CL were therefore fully aware some years ago of the benefits and need for such improvements but appear to have failed to proceed with the intentions expressed by the former. As stated above in §102 the dualling of the East Suffolk line will not be feasible during the period that it is being used for rail freight transport as there will be inadequate opportunity for track possessions for that construction.

105. WTC consider it is reasonable to assume that if approved the start of construction of Sizewell C is unlikely to occur before 2023 and thus rail freight use of the line will be required until around the mid 2030's assuming that the planned construction programme is met. Realistically it must be recognised that the particular reactor being built has a history of considerable delays to completion and rail freight use of the East Suffolk Line is likely to be required until the late 2030's or early 2040's.

106. If the line is not dualled prior to the use by Sizewell C rail freight, Network Rail's and most certainly SCC's intended date for dualling of the line will not be achieved. This will adversely impact the use of residents of East Suffolk as it can reasonably be expected there will be a return of passenger growth to pre COVID and capacity will be constrained.

107. The above is consistent with the oral representation given by WTC at the Open Floor Hearing and recommended by other oral presentations at the Open Floor Hearings.

108. In its Relevant Representations Report 9.1 NNBG CL has stated that a single passing loop was discounted as a means of achieving this goal, see page 118, as the differential speed of travel between the freight trains (20mph) and passenger trains (50mph) that the former would delay the latter unless freight train speed was increased, advised to WTC in a meeting with NNBG CL as up to 40mph outside 10mph areas. Works associated with permitting such speeds were not considered feasible. No mention however of an alternative such as that §100 above is made. Interested parties have suggested the same option. NNBG CL has stated, without supporting document, that their use of night-time trains is the only feasible option (last sentence page 118 of report 9.1).

109. WTC believe the ExA should require NNBG CL to construct improvements already identified by Network Rail and SCC so years ago as essential for Sizewell C rail freight use and the period immediately post Sizewell C.

110. Dualling would open the possibility for day-time freight train use and NNBG CL should be requested to consider both the ability to alter the strategy to daytime only freight trains or, if not feasible, to allow greater use of day time passages with a reduced number of night time train passages so as to have a period, ideally of 4 hours where no freight train use occurs.

111. Further dualling would have a further benefit for NNBG CL. It would help reduce road use as additional passenger trains could be laid on from Ipswich to Darsham and back for workers who would the take the connecting bus from the adjacent (Northern) Park & Ride to the construction site. Currently NNBG CL is intending to run buses from Ipswich to Sizewell C but without stops to collect workers at intervening locations such as Woodbridge, Melton and Campsea Ashe. Those workers, under the current proposals, will be using the local road network as the current passenger train timetable does not fit in with shift periods that NNBG CL is proposing.

**Conclusion**

112. WTC is firmly of the opinion that the Change 1 rail freight transport strategy is not viable, has no resilience and is doomed to fail if adopted. Such a failure will inevitably lead to impact on other freight management routes and most specifically it is likely to adversely impact on the road freight strategy by causing increase HGV use to alleviate lack of train passages during inevitable rail line stoppages on the single line section.

113. WTC calls for the ExA to require NNBG CL to accept the need to dual the single-track section of the East Suffolk line to provide resilience to its rail and thus overall freight management strategy.

114. This will enable daytime freight train use of the line without impacting on passenger train services with minimal, if any, requirement for night-time freight train use.

115. The dualling will accord with published SCC and NR strategies for the line.

116. The impact on residents along the line will be vastly reduced and the need for noise mitigation measures will be minimised.

117. Should the ExA not call for dualling then WTC requests that a truly viable option is submitted as a further change to the Application and that NNBG CL is required to revisit its noise assessment and mitigation proposals in line with the comments and observations in this report.