Medworth Energy from Waste
Combined Heat and Power Facility

PINS ref. EN010110
Document Reference: Vol 6.2
Revision 1.0
June 2022

Environmental Statement
Chapter 7: Noise and Vibration

Regulation reference: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 Regulation 5(2)(a)

We inspire with energy.

Contents

7. Noise and Vibration

7.1 Introduction

7.1.1 This chapter presents the environmental assessment of the likely significant effects of the Proposed Development with respect to noise and vibration.

7.1.2 The chapter should be read in conjunction with the description of the development provided in **Chapter 3: Description of the Proposed Development (Volume 6.2)** and with respect to relevant parts of **Chapter 6: Traffic and Transport (Volume 6.2)**, and **Chapter 11: Biodiversity (Volume 6.2)**, where common Receptors have been considered and where there is an overlap or relationship between the assessment of effects. A list of terms and abbreviations can be found in **Chapter 1: Introduction, Appendix 1F Terms and Abbreviations (Volume 6.4)**.

7.2 Consultation and Stakeholder engagement

7.2.1 The assessment has been informed by consultation responses and ongoing Stakeholder engagement. An overview of the approach to consultation is provided in **Chapter 4: Approach to the EIA (Volume 6.2).**

7.2.2 A summary of the relevant responses received in the EIA Scoping Opinion in relation to noise and vibration and confirmation of how these have been considered within the assessment to date is presented in **Table 7.1 Summary of EIA Scoping Opinion responses for noise and vibration**.

Table 7.1 Summary of EIA Scoping Opinion responses for noise and vibration

Consultee(s)	Issue raised	Response and how considered in this chapter
The Planning Inspectorate	**Construction vibration due to piling due to the routing of CHP ducting or the location of the transmission towers** If piling for the CHP and Grid Connections cannot be ruled out, then the assessment of potential piling activities must consider a worst-case. Any assumptions used to inform the assessment should be clearly defined, justified and explained in the ES.	The Proposed Development will be constructed using Continuous Flight Auger (CFA) piling. Percussive piling does not form any part of the Proposed Development. CFA piling does not give rise to significant levels of vibration. Airborne noise arising from CFA piling activities has been assessed in **Appendix 7B Construction Noise Assessment (Volume 6.4)**, which is summarised in **Section 7.9.**

Consultee(s)	Issue raised	Response and how considered in this chapter
The Planning Inspectorate	**Operational vibration due to vehicle movements** It was considered that insufficient justification was provided to support scoping this out of the assessment. It was stated that operational vibration from increased HGV movements should be considered where significant effects are likely to occur.	In consultation with the Consultant Environmental Health Officer (EHO) for FDC (on behalf of FDC, KLWN and CCC), as set out in **Table 7.2 Summary of EIA Scoping Opinion responses for noise and vibration**, it was agreed that vehicle induced vibration arises primarily from the road surface on the public highway, that this outside of the control of the Applicant, and that this aspect would, therefore, be scoped out. Whilst, in general, it is considered that significant effects from vehicle induced vibration are unlikely, potential effects due to vehicle induced vibration have been considered qualitatively at Receptors on New Bridge Lane in **Section 7.9.**
The Planning Inspectorate	**Noise emissions during construction and operational phases on dwellings referred to as 'Other nearest Receptors to the Energy from Waste CHP Facility'** *"The Inspectorate is content that significant effects on 'Other nearest Receptors' are unlikely to occur and that noise emissions from the EfW CHP Facility to 'Other nearest Receptors to the Energy from Waste CHP Facility' can be scoped out of the assessment."*	All Receptors categorised as 'Other nearest Receptors to the Energy from Waste CHP Facility' were agreed to be scoped out of the construction and operational noise assessments. However, one of these Receptors, 125 New Drove (R8), is located within the operational noise Study Area and representative baseline data was obtained for this location. Hence, this Receptor was scoped into the operational noise assessment. Potential Receptors, and Receptors scoped in and out of the assessment, are identified in **Section 7.6.** The assessment of construction and operational noise effects due to noise arising from the construction and operation of the EfW CHP Facility is provided in **Section 7.9.**

Consultee(s)	Issue raised	Response and how considered in this chapter
The Planning Inspectorate	**Receptors** *"Table 6.5 does not identify Receptors for the Temporary Construction Compound. The ES should include an assessment of noise from the compound where significant effects are likely."*	The location of the Temporary Construction Compound (TCC) required for construction of the Proposed Development is fixed, see **Figure 7.1 (Volume 6.3)**. The nearest Receptors have been identified and the assessment of noise from the TCC during the construction phase is provided in **Section 7.9.**
The Planning Inspectorate	**Receptors** *"In particular, the Scoping Report explains that a residential property is located on a site which is being considered for use as a Temporary Construction Compound. The ES should assess any likely significant effects on the residential property in the event that this option is progressed."*	The site under consideration at the scoping stage for the TCC, which included a residential property, no longer forms part of the Proposed Development, as it is not part of the preferred Grid Connection option. The selection of the preferred Grid Connection option is discussed in **Chapter 2: Alternatives (Volume 6.2)**. As such, there would not be any effects at this residential property and it is not assessed in this chapter. The location of the TCC required for the construction of the Proposed Development, and the nearest Receptors, have been identified and a summary of the construction noise assessment, accounting for activity in the TCC, is provided in **Section 7.9,** with further details provided in **Appendix 7B Construction Noise Assessments (Volume 6.4).**
Cambridgeshire County Council and Fenland District Council	The appropriate local policies should be referred to. Particularly, Policy CS34 Protecting Surrounding Uses of the adopted Minerals and Waste Core Strategy (2011) should be referred to. Reference should also be made to Policy DM3 of Delivering and Protecting High Quality Environments in Fenland Supplementary Planning Document July 2014.	The additional local policies identified have been referred to within the assessment where relevant and are detailed in **Section 7.3.** The policy documents are also referred to in **Chapter 5: Legislation and Policy (Volume 6.2).**

Consultee(s)	Issue raised	Response and how considered in this chapter
Cambridgeshire County Council	*"The suggested content of this chapter appears generally acceptable. However, particular consideration must be given to the prevention of nuisance that may be caused by the proposed use (bearing in mind the potential for 24 hour working involving plant and equipment, HGV movements and working that will be audible outside)."*	The assessment of the likely effects associated with the operation of the Proposed Development has been undertaken accounting for the operational plant and activities proposed, and the times of day when the activities would be undertaken. The assessment is provided in **Section 7.9.** In addition to assessing the likely significant effects of noise and vibration on nearby Receptors during operation in this chapter, the potential for noise (including vibration) nuisance have been addressed in a separate 'Statement of Statutory Nuisances' document submitted with the DCO application.
Cambridgeshire County Council	Baseline noise monitoring should be representative, robust and consist of monitoring at fixed positions over an adequate duration (3-4 days including a weekend). *"If fixed positions cannot be agreed then the Environmental Health Officer should be contacted to agree the approach to any alternative monitoring methods."*	A Survey and Monitoring Plan (SMP) was submitted to and agreed with the local authorities. This included the survey monitoring locations and durations of monitoring. The agreed SMP is provided in the Baseline Monitoring Report in **Appendix 7A Baseline Monitoring Report (Volume 6.4).**
Cambridgeshire County Council and Fenland District Council	During the baseline surveying, meteorological data should be obtained. The influence of wind direction on baseline sound levels should be considered when determining representative background sound levels.	Meteorological data was obtained at a representative sample of baseline noise monitoring locations, as described in the Baseline monitoring report provided in **Appendix 7A Baseline Monitoring Report (Volume 6.4).** The influence of weather conditions was taken into account when determining representative baseline conditions.

Consultee(s)	Issue raised	Response and how considered in this chapter
Cambridgeshire County Council **and** **Fenland District Council**	*"The noise impact assessment made in line with BS 4142:2014+A1:2019 should include in the appendix; all raw data, identification of excluded data, calculations and assumptions. Where the impact assessment identifies mitigation measures, these should be provided with attenuation calculations, and any assumptions made."*	The requirements are addressed in full in the ES, as set out in **Section 7.8.** Sufficient information has been obtained to undertake a full noise impact assessment in accordance with BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*[1], *as* presented in **Section 7.9**. The noise impact assessment identified the requirement for additional mitigation measures at 9 New Bridge Lane (R2) and 10 New Bridge Lane (R3). The barrier design has been discussed in **Section 7.10**, and the corresponding calculations have been provided in **Appendix 7C Operational Noise Assessment Data (Volume 6.4)**.
Cambridgeshire County Council **and** **Fenland District Council**	*"A construction and operational management plan should demonstrate how impacts to Receptors will be controlled if found to be necessary."*	An **Outline Construction Environmental Management Plan (Outline CEMP) (Volume 7.12)** is provided with this ES to be submitted with the DCO application. Construction of the Proposed Development in accordance with a final CEMP will be secured through DCO Requirement. An Outline Operational Noise Management Plan **(Appendix 7D Outline ONMP Volume 7.12)** has been prepared and submitted as part of the DCO. A refined ONMP will be submitted as a variation to the Environmental Permit (EP).
Cambridgeshire County Council	*"In addition to the potential impacts on existing residential premises, including those identified in the submitted scoping report, careful consideration must be given in respect of any other proposed development in the area."*	Various proposed and consented developments, and allocated development areas, have been assessed in terms of potential future Receptor locations and for cumulative effects. These assessments are provided in **Chapter: 18 Cumulative Effects Assessment (Volume 6.2)**.

[1] British Standards Institution, 2019. BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound. BSI, London.

Consultee(s)	Issue raised	Response and how considered in this chapter
Cambridgeshire County Council	*"The proposed allocated residential and industrial developments at Wisbech must be considered, particularly in relation to noise and odour from any activities proposed. In terms of noise, this may include the consideration of environmental noise barriers in the form of bunds or acoustic fence or a combination running continuously along some parts of the site boundary if appropriate. The final height and length of such environmental noise barriers could only be finalised by detailed noise modelling but to be effective it would have to be of such a height to block the direct line of sight to proposed residential property and habitable rooms. However, in considering such a barrier constraints such as existing access roads and the presence of surface water attenuation ponds /drainage features will need to be taken into account."*	Various proposed and consented developments, and allocated development areas (including Fenland Local Plan Policy LP8: East Wisbech (Strategic Allocation), South Wisbech (Broad Location for Growth), West Wisbech (Broad Location for Growth), Nene Waterfront and Port (Broad Location for Growth), Kings Lynn and West Norfolk: Site Allocations and Development Management Policy Plan – Policy F3.1. Wisbech Fringe - Land east of Wisbech (west of Burrowgate Road), and Wisbech Garden Town), have been assessed in terms of potential future Receptor locations and for cumulative effects. These assessments are provided in **Chapter: 18 Cumulative Effects Assessment (Volume 6.2)**. As indicated in **Chapter 18: Cumulative Effects Assessment (Volume 6.2)**, there was minimal potential for any effects or cumulative effects for any allocated development. Therefore, no acoustic barriers are proposed for protection of any allocated development.
Cambridgeshire County Council and Fenland District Council	*"The Anglia Community Eye Service Clinic (32 Cromwell Road, Wisbech, PE14 0SN) should be considered."*	The Anglia Community Eye Service Clinic (Eye Clinic) at 32 Cromwell Road, Wisbech, PE14 0SN (R25) has been considered within the assessment as shown in **Section 7.9.**

Consultee(s)	Issue raised	Response and how considered in this chapter
Cambridgeshire County Council and Fenland District Council	*"In line with the traffic and transport environmental impact assessment the noise impact assessment should include vehicle movements as well as operational equipment."*	Potential effects due to noise arising from vehicle movements associated with the construction and operation of the Proposed Development have been assessed both in terms of the change in road traffic noise level, due to increases of vehicle flows on the local highway network, and in terms of the contribution of noise from vehicle movements onto and around the operational EfW CHP Facility, in addition to noise arising from fixed operational plant and equipment. These assessments are presented in **Section 7.9.**

7.2.3 An overview of the key Stakeholders consulted following EIA Scoping and a summary of the issues discussed in relation to noise and vibration is presented in **Table 7.2 Summary of Stakeholder engagement for noise and vibration**.

Table 7.2 Summary of Stakeholder engagement for noise and vibration

Stakeholder	Date and Form of engagement	Issue(s) raised	Response
Cambridgeshire County Council, Norfolk County Council, Fenland District Council, King's Lynn and West Norfolk Borough Council	SMP issued via email 18 August 2020	SMP contained basis for scoping out baseline vibration monitoring, and details of proposed baseline noise monitoring, inc. locations, durations, acquisition of meteorological data and scoping out baseline monitoring at the Eye Clinic.	The Senior EHO for FDC raised no issue with the SMP and agreed that baseline vibration monitoring would not be required, as vibration effects are assessed against fixed limits, and baseline vibration data are only normally required where a significant source of vibration already exists. It was also agreed that any construction or operating techniques which are likely to give rise to significant effects should be predicted and assessed in accordance with BS 5228-2:2009 +A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*[2].

[2] British Standards Institution, 2014. BS 5228-2:2009 + A1:2014 Code of construction practice for noise and vibration control on construction and open sites – Part 2: Vibration. BSI, London.

Stakeholder	Date and Form of engagement	Issue(s) raised	Response
			No response was received from CCC. However, comments from FDC were understood to represent CCC's view, as FDC were the leading local authority stakeholder. The Principal EHO for KLWN (on behalf of KLWN and NCC), noted that the proposed survey locations (within the relevant administrative boundaries) will be adequately representative of Receptors near the Grid Connection, and requested confirmation of the methodologies and standards that would be referred to when presenting the results of the monitoring.
	SMP issued via email 13 October 2020	SMP updated to address queries and comments on the previous revision.	No response received.
	SMP issued via email 12 February 2021	SMP updated to include refined survey locations, backup survey locations and additional short term survey location. Provided proposed approach to the assessment in the event that baseline surveys cannot go ahead due to influence of lockdowns to control the spread of COVID-19.	The Senior EHO for FDC responded agreeing that baseline surveys may go ahead after 12 April 2021, assuming local activity has returned to normal following the lifting of lockdown restrictions in place to control the spread of coronavirus. They requested that data is provided (traffic and footfall data) demonstrating that local activity has returned to typical levels. They provided suggested amendments to the SMP, which have been addressed with further consultation. No response was received from CCC. However, comments from FDC were understood to represent CCC's view, as FDC were the leading local authority stakeholder.

Stakeholder	Date and Form of engagement	Issue(s) raised	Response
			The Principal EHO for KLWN (on behalf of KLWN and NCC), responded confirming they were satisfied with the content of the SMP. The officer stated they considered that the proposal to carry out baseline surveys after 12 April, 2021, was reasonable, assuming retail and other businesses were open following lifting of restrictions in place to control the spread of coronavirus.
	SMP issued via email 7 October 2021	SMP updated to refine proposed monitoring locations, including additional backup/alternative survey locations, and additional attended monitoring location (ST1-LT1) to validate unattended monitoring results obtained at backup monitoring location LT1c.	Following review of this issue of the SMP, a remote meeting was held on 15 October 2021 with the Consultant EHO for FDC (on behalf of FDC, KLWN, CCC and NCC) to discuss comments and amendments. All concerns raised were discussed and appropriate amendments agreed.
	Communication via e-mail from 11 November 2021 to 15 November 2021	Following commencement of the surveying, survey personnel identified a preferable alternative monitoring location for ST1. The preferred monitoring location (ST1 backup/alternative) was outlined for review and comment, noting that survey data acquired at ST1 in 2019 would be used to compare against the monitoring results acquired at the backup location.	The Principal EHO for KLWN (on behalf of KLWN and NCC) and the Consultant EHO for FDC (on behalf of FDC and CCC) confirmed their agreement, via email on 15 November 2021, that the alternative monitoring location was acceptable.
Local Residents	Non-statutory public consultations (March 2020 and October 2020)	Concern was raised over potential traffic noise impacts.	The assessment in **Section 7.9** addresses potential traffic noise impacts, using the relevant standards and guidance as outlined in **Section 7.3.**

Stakeholder	Date and Form of engagement	Issue(s) raised	Response
		Concern was raised over potential noise impacts during the construction phase.	The assessment of construction noise impacts is summarised in **Section 7.9**, with full details provided in **Appendix 7B Construction Noise Assessment (Volume 6.4).** Assessments of construction noise have been carried out using the relevant standards and guidance as outlined in **Section 7.3.**
		One respondent questioned how the effects of noise would be minimised.	The embedded mitigation measures used to control noise during the construction and operational phases are set out in **Section 7.7.**
Cambridgeshire County Council, Norfolk County Council, Fenland District Council, King's Lynn and West Norfolk Borough Council	Consultation via email sent 7 January 2022. Response received via email on 29 January 2022 from Consultant EHO for FDC (on behalf of CCC, FDC, KLWN and NCC).	Scoping out assessment of effects arising from vehicle induced vibration during the construction and operation of the Proposed Development.	Response confirmed agreement that the primary cause of vehicle induced vibration are irregularities in the road surface on the local highway network and that this is outside of the control of the Applicant. On this basis, agreed to scope out assessment of vehicle induced vibration. Whilst, in general, it is considered that significant effects from vehicle induced vibration are unlikely, potential effects due to vehicle induced vibration have been considered qualitatively at Receptors on New Bridge Lane in **Section 7.9.**
		Agreed to refer to criteria contained in BS 5228-1:2009+A12014 and BS 8233:2014 when determining impact magnitude criteria for non-residential premises.	Impact magnitude criteria for non-residential premises have been determined in accordance with BS 5228-1:2009+A12014 and BS 8233:2014, as shown in **Section 7.8**.

Stakeholder	Date and Form of engagement	Issue(s) raised	Response
		Agreed to provide statement confirming that the approach for the 2021 baseline surveys conforms with the requirements of the IOA and ANC's *'Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments'*[3]	The approach to the surveys is in accordance with the guidance provided in the IOA and ANC's *'Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments'* The 2021 survey data was validated against the 2019 monitoring results, and strategic noise mapping data, as set out in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**.
			Additionally, as many of the survey locations were noted to include a significant component of road noise, the Department for Transport data[4] was reviewed to indicate if the number of road vehicle movements were normal during the survey period. The data indicates variation in current road traffic levels referenced against the first week of February 2020, prior to the pandemic, based on automatic traffic counts from around 275 sites around Great Britain. The average use of all road vehicles during the 2021 survey period was 101%, indicating typical, normal usage of road vehicles during the survey period.
		Competence of personnel undertaking the survey work.	Agreed that all monitoring to be undertaken by personnel who, as a minimum, are Associate Members of the IOA (AMIOA) and all analysis and reporting to be overseen by personnel who, as a minimum, are full corporate Members of the IOA (MIOA).

[3] Association of Noise Consultants and the Institute of Acoustics, January 2021, Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments. ANC & IOA.

[4] Department of Transport, 30 March 2022. Domestic transport use by mode: Great Britain, since 1 March 2020. 'Covid-19-transport-use-statistics.ods'.

Stakeholder	Date and Form of engagement	Issue(s) raised	Response
			Statements of competence for all personnel contributing to the surveying and data analysis are provided in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**
Cambridgeshire County Council, Norfolk County Council, Fenland District Council, King's Lynn and West Norfolk Borough Council	Consultation via emails sent 17 January 2022. Responses received via email on 3 February 2022 and 14 February 2022 from Consultant EHO for FDC (on behalf of CCC, FDC, KLWN and NCC).	HDD for Grid Connection no longer required, Overhead Line (OHL) sections for Grid Connection not required. Therefore, no assessments of these elements required.	Agreed that, as no HDD is required for the Grid Connection, and no OHLs are proposed, that there is no requirement to address these elements in the assessment.
		Receptors to be considered and the relevant assessment methodologies to be used to assess construction and operational noise associated with the Grid Connection and construction noise associated with the Water Connection. Revised figure requested indicating Receptors to be considered in the assessment of noise arising from construction of the Grid Connection.	For construction noise affecting residential premises, agreed that the methods to be used are those contained in BS 5228-1. For operational noise, agreed that the methods to be used are those contained in BS 4142:2014+A1:2019. Provided figure indicating Receptors to be considered in the assessment of noise arising from construction of the Grid Connection. Proposed assessment locations agreed following review of figure provided. Receptor locations assessed are described in **Section 7.6** and shown in **Figure 7.3** (for the Grid Connection, and in **Figure 7.1**, **Figure 7.2**, **Figure 7.4** and **Figure 7.5** (all **Volume 6.3**) for other aspects assessed).

7.2.4 A summary of the relevant responses received to the PEIR, together with any subsequent discussions held in relation to noise and vibration and confirmation of how these have been considered within the assessment to date is presented in **Table 7.3 Summary of PEIR responses for noise and vibration together with any subsequent engagement**.

Table 7.3 Summary of PEIR responses for noise and vibration together with any subsequent engagement

Consultee	Issue raised	Response
Wisbech Town Council	Lack of baseline traffic data in the PEIR and influence on the conclusions of the assessment of likely significant effects.	The PEIR presented a preliminary assessment of the likely significant effects of the Proposed Development, based on information collected at that stage of the project. Since the PEIR, additional baseline traffic data has been collected at all road links requested by National Highways and CCC, and this data has been used to inform the assessment presented in **Section 7.9**.
	The Non-Technical Summary (NTS) identifies potential significant effects due to operational noise at 9 and 10 New Bridge Lane, however there is a lack of information to assist in the understanding of the likely magnitude of the impact, taking account of the existing baseline sound levels.	The PEIR was prepared based on monitoring data from 2019. A further, more detailed, monitoring campaign was undertaken in 2021. Subsequently a more detailed dataset was considered within the EIA. The baseline monitoring report, setting out the detailed baseline monitoring results, is provided in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**. The NTS **(Volume 6.1)** sets out the potential for significant effects, accounting for existing baseline conditions.
	Lack of baseline information for Receptors potentially affected by the CHP Connection and the Grid Connection.	The PEIR was prepared based on monitoring data from 2019. A further, and more detailed monitoring campaign was undertaken in 2021. Subsequently a more detailed dataset was considered within the EIA. The baseline monitoring report, setting out the detailed baseline monitoring results, including results obtained at locations representative of those most likely to be affected by the CHP Connection and Grid Connection, is provided in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**.
	Concern over potential significant effects due to use of Horizontal Directional Drilling (HDD) which is not referred to in the NTS.	Potential construction noise from HDD activity to facilitate the Water Connections has been assessed in **Appendix 7B Construction Noise Assessments (Volume 6.4)** and is summarised in **Section 7.9**. No HDD is proposed for the Grid Connection. The NTS **(Volume 6.1)** sets out the potential for significant effects due to HDD activity.

7.3 Relevant legislation, planning policy, technical guidance

Legislative context

7.3.1 Legislation relevant to the assessment of the effects on noise and vibration sensitive Receptors is provided in **Table 7.4 Summary of PEIR responses for noise and vibration together with any subsequent engagement** below:

Table 7.4 Legislative context for noise and vibration

Legislation	Implications
Control of Pollution Act, 1974 (CoPA)[5]	Defines the legislative basis for the control of noise and vibration from construction activities, including codes of practice and Best Practicable Means (BPM).
Environmental Protection Act, 1990 (EPA)[6]	The EPA covers statutory nuisance and sets out the duty for local authorities to detect statutory nuisances within their administrative areas. However, the responsibility to control environmental impacts from sites requiring an EP to operate lies with the Environment Agency, in accordance with the Environmental Permitting Regulations 2016.
Environmental Permitting Regulations 2016 (EPR)[7] (as amended)	The EPR requires that certain types of sites, meeting specific criteria, require an EP to operate. An EP sets out various criteria for the control of emissions to the environment. An EP will be required to operate the Proposed Development and will be applied for in tandem with the DCO application. The EIA will form the primary basis for the determination of the EP.

Planning policy context

7.3.2 There are a number of policies at the national and local level that are relevant to the Proposed Development. The overarching national policy statements, which provide the primary policy basis for the consideration of Nationally Significant Infrastructure Projects, are provided in **Table 7.5 Planning policy context for noise and vibration: Adopted National Policy Statements**. This section should be read in conjunction with **Chapter 5: Legislation and Policy (Volume 6.2)**.

Table 7.5 Planning policy context for noise and vibration: Adopted National Policy Statements

Policy reference	Implications	Section addressed
Overarching National Policy	Section 5.11.1 of EN-1 refers to the Noise Policy Statement for England (NPSE)[9], which is the overarching noise policy statement. Section 5.11.4 of EN-1 advises	The NPSE is summarised below in **Table 7.7 Planning policy context**

[5] HMSO, 1974. Control of Pollution Act 1974.
[6] HMSO, 1990. Environmental Protection Act 1990.
[7] HMSO, 2016. Environmental Permitting Regulations (as amended).
[9] DEFRA, 2010. Noise Policy Statement for England.

Policy reference	Implications	Section addressed
Statement for Energy (EN-1)[8]	that noise should be considered in the shorter term (construction phase) and the longer term (operation).	**for noise and vibration: National and local planning policies.** The scope of the assessment of construction and operational effects is provided in **Section 7.6** and the methodologies for the assessments are set out in **Section 7.8**.
National Policy Statement for Renewable Energy Infrastructure (EN-3)[10]	Section 2.5.53 of EN-3 sets out specific considerations which apply to biomass and EfW generating stations. These are set out as follows. Sources of noise and vibration may include: delivery and movement of fuel and materials, processing waste for fuel at EfW generating stations, the gas and steam turbines that operate continuously during normal operation and external noise sources such as externally-sited air-cooled condensers that operate continuously during normal operation.	All plant and activities with significant noise generation potential have been considered in the assessment, as outlined in **Section 7.9.**
National Policy Statement for Electricity Networks Infrastructure (EN-5)[11]	EN-5 sets out specific information in relation to Noise and Vibration in the context of electricity networks. Section 2.9 states that the applicant's assessment requires an alternative noise assessment method to deal with rain-induced noise of corona discharge, as BS 4142:2014+A1:2019 (for example) may not be appropriate. This is primarily because BS 4142:2014+A1:2019 requires that baseline data is gathered during periods when there is no precipitation. EN-5 notes the method developed by National Grid as described in report TR(T)94,1993[12] and that this follows recommendations broadly outlined in ISO 1996 (BS 7445:1991)[13] and as such is consistent with BS 4142:1997[14]. EN-5 states that the Infrastructure Planning Committee (IPC) (and, it is considered therefore, the examining authority) ".is likely to be able to regard it as acceptable for the applicant to use this or another methodology that appropriately addresses these particular issues."	At PEIR stage OHL were part of the design, however, the Proposed Development does not include OHL, so no TR(T)94, 1993 assessment is included in the ES.

[8] Department for Energy & Climate Change, 2011. Overarching National Policy Statement for Energy (EN-1). [.
[10] Department for Energy & Climate Change, 2011. National Policy Statement for Renewable Energy Infrastructure (EN-3).
[11] Department for Energy & Climate Change, 2011. National Policy Statement for Electricity Networks Infrastructure (EN-5).
[12] National Grid, 1993. TR(T)94 – A Method for Assessing the Community Response to Overhead Line Noise, Issue 1. National Grid Technology & Science Laboratories.
[13] International Standards Organisation, 1991. ISO 1996:1982 (BS 7445:1991) Description and measurement of environmental noise. BSI, London.
[14] British Standards Institution, 1997. BS 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas. BSI, London.

7.3.3 In September 2021, the Department of Business, Energy and Industrial Strategy (BEIS) consulted upon a review of energy National Policy Statements (NPS) with consultation closing on 29 November 2021. The energy NPS were reviewed to reflect the policies and broader strategic approach set out in the Energy white paper and ensure a planning framework was in place to support the infrastructure requirement for the transition to net zero.

7.3.4 **Table 7.6 Planning policy context for noise and vibration: Draft National Policy Statements** summarises those Draft energy NPS which are considered to be relevant to the Proposed Development.

Table 7.6 Planning policy context for noise and vibration: Draft National Policy Statements

Policy reference	Implications	Section addressed
Draft Overarching National Policy Statement for Energy (EN-1)[15]	Section 5.12 of the draft EN-1 refers to noise and vibration. As with the current EN-1 Policy, Section 5.12.1 of the draft EN-1 refers to the Noise Policy Statement for England (NPSE), which is the overarching noise policy statement. The draft EN-1 advises that noise should be considered in the shorter term (construction phase) and the longer term (operation) in Section 5.12.4.	The NPSE is summarised below in **Table 7.7**. The scope of the assessment of construction and operational effects is provided in **Section 7.6** and the methodologies for the assessments are set out in **Section 7.8**.
Draft National Policy Statement for Renewable Energy Infrastructure (EN-3)[16]	As with the current EN-3 Policy, Section 2.15.1 in the draft EN-3 describes the specific considerations which apply to biomass and EfW generating stations as set out below. Sources of noise and vibration may include: delivery and movement of fuel and materials, processing waste for fuel at EfW generating stations, the gas and steam turbines that operate continuously during normal operation and external noise sources such as externally-sited air-cooled condensers that operate continuously during normal operation.	All plant and activities with significant noise generation potential have been considered in the assessment, as outlined in **Section 7.9.**
Draft National Policy Statement for Electricity Networks Infrastructure (EN-5)[17]	As with the current Policy, the draft EN-5 sets out specific information in relation to Noise and Vibration in the context of electricity networks.	At the PEIR stage OHL were part of the design, however, the Proposed Development does not include OHL, so assessment is no longer necessary.

15 Department for Energy & Climate Change, 2021. Draft Overarching National Policy Statement for Energy (EN-1).
16 Department for Energy & Climate Change, 2021. Draft National Policy Statement for Renewable Energy Infrastructure (EN-3).
17 Department for Energy & Climate Change, 2021. Draft National Policy Statement for Electricity Networks Infrastructure (EN-5).

7.3.5 Other national and local policies which may provide additional guidance which can be considered material to the consideration of a NSIP are detailed in **Table 7.7 Planning policy context for noise and vibration: National and local planning policies**, below.

Table 7.7 Planning policy context for noise and vibration: National and local planning policies

Policy reference	Implications	Section addressed
National Planning Policy Framework (NPPF)[18]	The NPPF advises that significant adverse impacts on health and the quality of life as a result of noise from new development should be avoided. It also advises that other adverse impacts on health and quality of life arising from noise from new development should be reduced to a minimum. Paragraph 174 of the NPPF states that the planning system should contribute to and enhance the natural and local environment by, (amongst other considerations): "Preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability". The NPPF goes on to state in Paragraph 185 that "Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should: A) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life; B) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason." Paragraph 187 advises that "Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed." This should be	The policy requirements of the NPPF have been considered throughout the assessment, and during the preparation of the ES. The methodology is set out in **Section 7.8**.

[18] Ministry of Housing, Communities and Local Government, 2021. National Planning Policy Framework.

Policy reference	Implications	Section addressed
	taken into account when considering whether proposed development is an acceptable use of land. The NPPF document does not refer to any other documents regarding noise other than the NPSE.	
Noise Policy Statement for England (NPSE)	The NPSE introduces concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are: NOEL – No Observed Effect Level This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. LOAEL – Lowest Observed Adverse Effect Level This is the level above which adverse effects on health and quality of life can be detected. Extending these concepts for the purpose of the NPSE leads to the concept of a significant observed adverse effect level. SOAEL – Significant Observed Adverse Effect Level. This is the level above which significant adverse effects on health and quality of life occur. It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different Receptors and at different times. The first aim of the NPSE is: “Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.” The second aim is: “Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.” The third aim of the NPSE is: “Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.” Further guidance on the different effect levels is described in Planning Practice Guidance – Noise[19],	The overarching requirements of the NPSE has been applied throughout the assessment. The resultant effect level due to each aspect of the assessment has been defined following determination of significance, as described in **Section 7.8.**

[19] Ministry of Housing, Communities and Local Government, 2019. National Planning Practice Guidance.

Policy reference	Implications	Section addressed
	provided in **Table 7.8. Planning policy context for noise and vibration: Guidance in NPSE effect levels provided in PPG-N – Noise Exposure Hierarchy**	
National Planning Policy for Waste (2014)	The National Planning Policy for Waste sets out the requirements for waste management developments in conjunction with the NPPF. Appendix B states: "Considerations will include the proximity of sensitive Receptors. The operation of large waste management facilities in particular can produce noise affecting both the inside and outside of buildings, including noise and vibration from goods vehicle traffic movements to and from a site. Intermittent and sustained operating noise may be a problem if not properly managed particularly if night-time working is involved. Potential light pollution aspects will also need to be considered."	The noise and vibration sensitive Receptors in relation to the Proposed Development are discussed in **Section 7.8**.
Local Policy		
Cambridgeshire County Council and Peterborough City Council Minerals and Waste Local Plan 2036 (2021)[20] **Policy 18**	As described in **Chapter 5: Legislation and Policy (Volume 6.2)**, Cambridgeshire County Council and Peterborough City Council Minerals and Waste Local Plan was adopted on 28 July 2021. Policy 18: 'Amenity Considerations' states: "Proposals must ensure that the development proposed can be integrated effectively with existing or planned (i.e. Development Plan allocations or consented schemes) neighbouring development. New development must not result in unacceptable adverse impacts on the amenity of existing occupiers of any land or property." The relevant requirements of the current minerals and waste local plan are detailed below. It is noted that, with regard to potential noise and vibration impacts, the requirements of the draft plan and the current plan are broadly similar, as they both require minerals and waste developments not to give rise to unacceptable impacts to amenity of any nearby property.	Potential impacts due to the Proposed Development are considered in **Section 7.9**.
Cambridge and Peterborough Minerals and Waste Core Strategy (2011)[21] **Policy CS24 and CS34**	Policy CS24 'Design of Sustainable Minerals and Waste Management Facilities' states that 'all proposals for either minerals or waste management development will be required to achieve high standards in their design and mitigation of environmental impacts.' Policy CS34 'Protecting Surrounding Uses' states that 'mineral and waste management development will only be permitted where it can be demonstrated that there would be no significant harm to the environment, human	Where practicable, low noise equipment has been selected to reduce noise at the Receptors. This is described in **Chapter 3: Description of the Proposed Development (Volume 6.2)**, and in **Section 7.7**.

[20] Cambridgeshire County Council and Peterborough City Council, 2021. Minerals and Waste Local Plan. Adopted July 2021.
[21] Cambridgeshire County Council and Peterborough City Council, 2011. Cambridgeshire and Peterborough Minerals and Waste Development Plan Adopted Core Strategy.

Policy reference	Implications	Section addressed
	health or safety, existing or proposed neighbouring land uses, visual intrusion or loss to residential or other amenities. Mitigation measures will be required, including where appropriate a buffer zone, between the proposed development and neighbouring existing or proposed sensitive land uses.'	Potential impacts due to the Proposed Development are considered in **Section 7.9**. The requirement for any additional mitigation measures has been determined as part of the EIA process and has been confirmed in **Section 7.10**.
Cambridgeshire County Council and Peterborough City Council Minerals and Waste Local Plan 2036 (2021) **Appendix 3: Location and Design of Waste Management Facilities (2021)**	The Cambridgeshire and Peterborough Minerals and Waste Local Plan (MWLP) contains a suite of policies that require waste management facilities to be built in suitable locations, and to achieve a high quality in their design. Appendix 3 of the document outlines the requirements of the design and location of new waste developments.	Potential impacts due to the Proposed Development are considered in **Section 7.9**, additional mitigation is considered in **Section 7.10**.
Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD 2010-2026 (2011)[22]	The Norfolk Core Strategy and Minerals and Waste Development Management Policies lay out the requirements for new developments under the jurisdiction of Norfolk Council. Policy CS14 – Environmental protection states: *"The protection and enhancement of Norfolk's natural and built environments is a vital consideration for future minerals extraction and associated development and waste management facilities in the county. In particular, developments must ensure that there are no unacceptable adverse impacts on, and ideally improvements to: Residential amenity e.g. noise, vibration dust, light, and visual intrusion."* Policy CS15 – Transport relates to the vehicle movements associated with the Proposed Development and states: *"All proposed minerals extraction and waste management facilities must assess and consider positively the potential for non-HGV transportation of materials to and/or from the facilities, principally by rail or water. This assessment must be included within the Transport Statement/Transport Assessment, if one is required (see Policy DM10. c) Unacceptable impacts on air quality (particularly in relation to any potential breaches of National Air Quality Objectives and impacts on any Air Quality Management Areas) and residential and rural amenity, including from odour and noise."*	Potential impacts due to the Proposed Development are considered in **Section 7.9**. Where practicable, low noise equipment has been selected to reduce noise at the Receptors. This is described in **Chapter 3: Description of the Proposed Development (Volume 6.2)**, and in **Section 7.7.** The requirement for any additional mitigation measures has been determined as part of the EIA process and has been confirmed in **Section 7.10** .

[22] Norfolk County Council, 2011, Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD

Policy reference	Implications	Section addressed
Fenland Local Plan (Adopted) (2014)[23] **Policy LP16**	Policy LP16 'Delivering and Protecting High Quality Environments across the District' permits development subject to a number of criteria including that they should not adversely impact on the amenity of neighbouring uses such as noise. It also states that proposals should set out how to mitigate risks from noise.	Potential impacts due to the Proposed Development are considered in **Section 7.9.** Where practicable, low noise equipment has been selected to reduce noise at the Receptors. This is described in **Chapter 3: Description of the Proposed Development (Volume 6.2)**, and in **Section 7.7.** The requirement for any additional mitigation measures has been determined as part of the EIA process and has been confirmed in **Section 7.10**.
Fenland District Council Delivering and Protecting High Quality Environments in Fenland Supplementary Planning Document 2014[24]	Policy DM3 'Making a Positive Contribution to Local Distinctiveness and Character of the Area' states that in order to satisfy the requirements of Local Plan Policy LP16, 'all development should achieve high design quality and as a minimum ensure that: • The development provides high quality and attractive public spaces; • Provision for parking motor vehicles does not dominate the design of the scheme or the resulting street scene; • Any existing views, focal points and landmarks of value are incorporated into the scheme; • The character of the landscape, local built environment and settlement pattern inform the layout, density, proportions, scale, orientation, materials and features (including boundary treatment) of the Proposed Development, which should aim to improve and reinforce positive features of local identity; and • Proposals are robust to withstand and adapt to the predicted impacts of climate change including measures to manage the risk of flooding and subsidence.'	The most relevant aspect of Policy DM3 to the assessment of noise and vibration is the reference to 'high design quality' prior to the subclauses. Where practicable, low noise equipment has been selected to reduce noise at the Receptors. This is described in **Chapter 3: Description of the Proposed Development (Volume 6.2)**, and in **Section 7.7.**

[23] Fenland District Council, 2014. Fenland Local Plan.
[24] Fenland District Council, 2014. Delivering and Protecting High Quality Environments in Fenland Supplementary Planning Document.

Policy reference	Implications	Section addressed
King's Lynn and West Norfolk Local Development Framework Core Strategy (2011)[25]	There is no specific reference to noise within the Core Strategy, however as Energy from Waste is a partially renewable source of energy, it is considered that aspects of Policy CS08 'Sustainable Development' apply: '… Renewable Energy. The Council and its partners will support and encourage the generation of energy from renewable sources. These will be permitted unless there are unacceptable locational or other impacts that could not be outweighed by wider environmental, social, economic and other benefits.'	Potential impacts due to the Proposed Development are considered in **Section 7.9.**
King's Lynn and West Norfolk Local Development Framework Site Allocations and development Management Policies (2016)[26] **Policy DM15 and DM20**	Policy DM15 'Environment, Design and Amenity' recognises that noise can give rise to impacts upon amenity and that proposals will be assessed against this as a factor. Policy DM20 Renewable Energy states that applications will be assessed to determine whether the benefits are outweighed by the impacts with reference to noise.	Potential impacts due to the Proposed Development are considered in **Section 7.9**.

7.3.6 **Table 7.8 Planning policy context for noise and vibration: Guidance in NPSE effect levels provided in PPG-N – Noise Exposure Hierarchy** provides the context of effect levels due to the Proposed Development as described in the Planning Guidance.

Table 7.8 Planning policy context for noise and vibration: Guidance in NPSE effect levels provided in PPG-N – Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level (NOEL)			
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect (NOAEL)			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required

[25] King's Lynn and West Norfolk Borough Council, 2011. Local Development Framework – Core Strategy.
[26] King's Lynn and West Norfolk Borough Council, 2016. Site Allocations and Development Management Policies Plan.

Perception	Examples of Outcomes	Increasing Effect Level	Action
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or physiological response, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or 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 sleep disturbance resulting in difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Unacceptable Adverse Effect Level (UAEL)			
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress or psychological effects, e.g., regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Technical guidance

7.3.7 Technical guidance used to inform the assessment is listed in **Table 7.9 Technical guidance for noise and vibration assessment** below.

Table 7.9 Technical guidance for noise and vibration assessment

Technical guidance	Implications
BS 5228–1:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*[27]	Standard for construction noise magnitude of impact and threshold of sensitivity.
BS 5228–2:2009+A1:2014 *Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration*	Standard for construction vibration magnitude of impact and threshold of sensitivity.

[27] British Standards Institution, 2014. BS 5228-1:2009 + A1:2014 Code of construction practice for noise and vibration control on construction and open sites – Part 1: Noise. BSI, London.

Technical guidance	Implications
Calculation of Road Traffic Noise (CRTN) (1988)[28]	The 'Calculation of Road Traffic Noise' (CRTN), provides a methodology for predicting noise levels due to road traffic.
Design Manual for Roads and Bridges LA 111 (DMRB) (2020)[29]	Contains methods and criteria for the assessment of noise and vibration impacts which may arise from road schemes, including new roads, road improvements and maintenance. The criteria contained within DMRB LA 111 has been used to determine the magnitude of impact due to increases in traffic noise resulting from changes in traffic flows on the local highway network.
BS 4142:2014+A1:2019 ***Methods for rating and assessing industrial and commercial sound***	Standard for determining magnitude of impact of the operational noise upon local Receptors.
Guidelines for environmental noise impact assessment[30]	Contains guidance on undertaking EIA for noise impacts, including guidance on criteria for ambient noise changes.
ISO 9613-2:1996 ***Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation***[31]	This standard details the prediction methodology which has been used to predict operational noise levels. Operational noise levels have been predicted using noise modelling software which implements this prediction methodology.
NANR116: Open/Closed Window Research – Sound Insulation through Ventilated Domestic Windows[32]	This document contains the results of research carried out in order to determine sound reduction due to windows in different states of opening and has been referred to when considering likely internal sound levels due to a particular external sound level.
World Health Organisation (WHO) Guidelines for Community Noise[33]	Presents guideline noise levels for community noise in specific residential environments. The criteria presented in this guidance has been referred to when considering potential impacts due to absolute sound levels.
BS 8233:2014 ***Guidance on sound insulation and noise reduction for buildings***[34]	Presents guidelines for ambient noise levels for various situations. Criteria for executive offices and for reliable speech communication have been used to assess noise impacts at industrial and commercial Receptors.

[28] HMSO, 1998. Calculation of Road Traffic Noise.
[29] Highways England, Transport Scotland, Welsh Government and Department for Infrastructure, 2020. Design Manual for Roads and Bridges LA111: Noise and vibration.
[30] IEMA, November 2014. Guidelines for environmental noise impact assessment, Version 1.2.
[31] International Standards Organisation, 1996. ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation. ISO, London.
[32] The Building Performance Centre, School of the Built Environment, Napier University, 2007. NANR116: Open/Closed Window Research – Sound Insulation through Ventilated Domestic Windows.
[33] World Health Organisation, 1999. Guidelines for Community Noise. WHO, Geneva.
[34] British Standards Institute, 2014, BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. BSI, London.

7.3.8 Predictions of noise levels have been undertaken implementing the prediction methodology provided in ISO 9613-2:1996 '*Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation'*. The use of this prediction methodology provides a conservative approach. This is because the alternative, the basic prediction methodology provided in BS 5228-1, typically overestimates the attenuation due to propagation over soft ground and the attenuation due to barriers and screening.

7.3.9 For the construction noise assessment, thresholds of potential significance have been determined using the ABC method provided in Annex E of BS 5228-1 on the basis of the measured baseline sound levels. Table E.1 is reproduced in **Table 7.10 Example threshold of significant effect at dwellings**.

Table 7.10 Example threshold of significant effect at dwellings

Assessment category and threshold value period (L_{Aeq})	Threshold value, in decibels (dB)		
	Category A[A)]	Category B[B)]	Category C[C)]
Night-time (23:00-07:00)	45	50	55
Evenings and weekends [D)]	55	60	65
Daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

NOTE 1 A significant effect has been deemed to occur if the total LAeq noise level, including construction, exceeds the threshold level for the Category appropriate to the ambient noise level.
NOTE 2 If the ambient noise level exceeds the threshold values given in the table (i.e., the ambient noise level is higher than the above values), then a significant effect is deemed to occur if the total LAeq noise level for the period increases by more than 3 dB due to construction activity.
NOTE 3 Applied to residential Receptors only.

[A)] Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
[B)] Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
[C)] Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.
[D)] 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

7.3.10 For the operational noise assessment, thresholds for the potential significance to be used when considering the initial estimate of impact have been determined using the approach laid out in BS 4142:2014+A1:2019 Section 11, Assessment of impacts, which states:

"NOTE 1 More than one assessment might be appropriate.

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."

7.3.11 In accordance BS 4142:2014+A1:2019 the final determination of significance will depend on consideration of context, as set out in **Section 7.8**.

7.4 Data gathering methodology

Study Area

7.4.1 The Study Area for the assessment is outlined below for each of the different elements of the Proposed Development. The determination of the Study Area for each element of the Proposed Development has been based on relevant guidance, where available, and, where no guidance is available, on professional judgement and experience of similar facilities.

7.4.2 In general, assessments are limited to the consideration of the nearest Receptors, as Receptors further away would be most unlikely to experience effects greater than those experienced at the nearest Receptors. This approach, in relation to the EfW CHP Facility, was detailed in the EIA Scoping Report and confirmed as acceptable by the Planning Inspectorate (PINS) in the EIA Scoping Opinion, as set out in **Table 7.1 Summary of EIA Scoping Opinion responses for noise and vibration**. Based on the above, proposed baseline data gathering has been limited to locations representative of the nearest Receptors to each element of the Proposed Development.

7.4.3 For construction noise and vibration, there is no specific guidance contained in BS 5228-1:2009+A1:2014 or BS 5228-2:2009+A1:2014 on the determination of study areas. With regard to construction noise, DMRB LA 111 notes that *"A study area of 300 m from the closest construction activity is normally sufficient to encompass noise sensitive Receptors."*

7.4.4 Therefore, the Study Area for construction noise includes an area up to 300m away from the activities.

7.4.5 With regard to construction vibration, DMRB LA 111 notes that *"A Study Area of 100m from the closest construction activity with the potential to generate vibration is normally sufficient to encompass vibration sensitive Receptors"*. Therefore, the Study Area for construction vibration is limited to 100m from any significant source of vibration associated with the construction and operation of the Proposed Development. The only significant source of vibration associated with the construction and operation of the Proposed Development is the proposed use of vibratory rollers for construction of the Access Improvements.

EfW CHP Facility, CHP Connection, Access Improvements, TCC and Water Connections

7.4.6 Initially the proposed Study Area for operational noise from the project components described above was defined as a circle of 1km radius, centred on the centroid of the EfW CHP Facility Site. However, on the basis of professional judgement, it was considered prudent to increase the Study Area to a zone 1km from the site boundary. Potential adverse noise effects will likely be confined to those Receptors in closest proximity to the EfW CHP Facility, due to attenuation of noise over distance. The Study Area for operational noise from the EfW CHP Facility is provided in **Figure 7.5: Study Area: Operational noise - EfW CHP Facility**.

7.4.7 With regard to potential noise impacts due to changes in traffic flows on construction and operational vehicular access routes, DMRB LA 111 states that the study area for Receptors near existing road links can be determined as follows: *"the area within 50m of other* (i.e., not new) *road links with potential to experience a short term BNL change of more than 1.0 dB(A) as a result of the project"*. DMRB LA 111 notes that the determination of an appropriate study area can be varied for specific projects and to account for the risk of likely significant effects. As such, the Study Area for potential traffic noise impacts along construction and operational vehicular access routes is defined as 50m from affected road links. In accordance with DMRB LA 111, depending on the outcomes of the assessments based on this Study Area, the spatial scope of the assessments may be expanded to account for Receptors at greater distances from affected road links. The Study Area for traffic noise is indicated in **Figure 7.4: Traffic noise Study Area construction & operational vehicular access routes**.

7.4.8 Diagrams indicating the Study Areas for construction noise and vibration for the EfW CHP Facility, TCC, Access Improvements, Water Connections and CHP Connection are provided in **Figure 7.1: Construction noise & vibration Study Area- EfW CHP Facility, Access Improvements and Water Connections** and **Figure 7.2: Construction noise Study Area – CHP Connection**.

Grid Connection

7.4.9 Significant effects due to operational noise from the additional plant at the Walsoken Substation where the Grid Connection terminates would likely be confined to the nearest Receptors. This is on the basis that minimal additional operational plant is anticipated to be required to facilitate the Grid Connection at the connecting substation. Therefore, the Study Area for operational noise from any additional plant at the Walsoken Substation connection is 300m.

7.4.10 There are no OHL sections proposed as part of the Grid Connection. There is, therefore, no assessment of OHL noise.

7.4.11 Diagrams indicating the Study Areas for construction noise and operational noise from the Grid Connection are provided in **Figure 7.3: Noise model input: construction scenarios (EfW CHP Facility, including Grid Connection and Water Connection along New Bridge Lane).**

Desk study

7.4.12 A desktop study, based on review of aerial imagery, was undertaken to identify Receptors that could potentially be affected by noise and vibration arising from the construction and operation of the Proposed Development. A summary of the desktop data used is provided in **Table 7.11 Desktop data for noise and vibration assessment** below.

Table 7.11 Desktop data for noise and vibration assessment

Desktop data	Source of desktop data	Details of the information
Aerial imagery from Google Earth Pro	Google Earth Pro	Aerial views of the different Study Areas described above in **paragraph 7.4.1** to **paragraph 7.4.7**, and surrounding environs, to establish potential noise sensitive Receptors.
Ordnance Survey maps	Ordnance Survey	Maps providing an overall view of the Proposed Development, and surrounding areas, to establish potential noise sensitive Receptors.
Details of consented developments within the Zone of Influence (ZoI) of the Proposed Development	Host Authorities' planning systems	A planning review has been undertaken to review consented developments in the area. Details of the review and the consented developments considered are provided in **Chapter 18: Cumulative Effects Assessment (Volume 6.2).** All planning applications within Zones of Influence have been identified. The review has identified no consented Receptors within 1km of the EfW CHP Facility Site. However, there are residential allocations within 1km of the EfW CHP Facility Site. No other developments have been identified which would be likely to result in any cumulative noise and vibration impacts.

Survey work

7.4.13 A summary of the survey results used to inform the assessment undertaken to date and the outstanding data requirements are provided in **Table 7.12 Surveys for noise and vibration assessment** below.

Table 7.12 Surveys for noise and vibration assessment

Survey	Survey dates	Survey methodology	Outstanding survey requirements
Baseline noise survey	12 – 13 November 2019	This initial baseline noise survey was undertaken at an early stage in the design	None.

Survey	Survey dates	Survey methodology	Outstanding survey requirements
		process to inform the design of the Proposed Development. The survey was undertaken following the guidance provided in BS 4142:2019+A1:2019. The surveying consisted of short term attended measurements during the daytime, evening and night-time at four locations representative of the Receptors nearest to the EfW CHP Facility. Though the dataset is limited, it was adequate to characterise the baseline noise environment in accordance with BS 4142:2019+A1:2019. Measurements were undertaken during daytime and night-time periods and were representative of baseline conditions at 9 and 10 New Bridge Lane, the dwelling known as 'Potty Plants' and 'The Chalet' on New Drove. This survey has been supplemented by further, more detailed, baseline monitoring to inform the EIA. Data acquired during the initial baseline survey has been referred to when determining representative baseline sound levels, to validate additional survey data and ensure that additional survey data was not unduly affected by any changes in local conditions that may have occurred due to COVID-19. Comparisons of the 2019 data with the additional survey data, acquired as described below, provided in **Appendix 7A Baseline Monitoring Report (Volume 6.2)**, indicate that there was minimal variation in local conditions during the different survey periods.	
Baseline noise surveys	10 – 18 November 2021	The detailed methodology, results and analysis for the baseline surveying are provided in **Appendix 7A Baseline Monitoring Report (Volume 6.2)**. The survey methodology (including the survey locations, duration of monitoring, details to be reported, etc) was agreed in writing with all local authorities, as set out in **Table 7.2 Summary of Stakeholder engagement for noise and vibration**, prior to commencing the survey work.	None.

Survey	Survey dates	Survey methodology	Outstanding survey requirements
		The monitoring consisted of unattended monitoring over a duration of approximately seven days at three locations, with concurrent attended monitoring at an additional eight locations at different times of the day and night.	

7.4.14 A summary of the survey locations of the 2021 survey is shown in **Table 7.13 Summary of monitoring locations, November 2021**. The survey locations are identified in **Figure 7.1** to **Figure 7.5 (Volume 6.3)**.

Table 7.13 Summary of monitoring locations, November 2021

Location Reference	Location description	Location Co-ordinates		Monitoring period	Approx. distance and direction from EfW CHP Facility Site boundary
		Latitude	Longitude		
LT1c	Southern boundary of the EfW CHP Facility Site, approximately 40m east southeast of 9 New Bridge Lane.	52’38'53”55"	0’ 8'53”18"	10/11/2021 – 18/11/2021	On southern tip of site, 20m north of southern bound.
LT2	On a bridge over a drainage ditch, near to a residential Receptor adjacent to the A47 known as ‘Potty Plants’.	52’38'45”33"	0’ 9'10”88"	10/11/2021 – 17/11/2021	350m south-east
LT3	At 93 South Brink. 5m north-west of house and 5m southeast of edge of carriageway.	52’39'2.72”	0’ 8'26”13"	10/11/2021 – 18/11/2021	560m west
ST-LT1	On New Bridge Lane approximately equidistant between LT1 (10 New Bridge Lane) and LT1a (9 New Bridge Lane).	52’38'52”54"	0’ 8'53”38"	10/11/2021 – 11/11/2021 16/11/2021 – 17/11/2021	5m south
ST1 (Backup/Alternative)	On New Drove 7-32 approx. 500m north-east of junction of New Bridge Lane & New Drove.	52’38'56”87"	0’ 9'28”40"	10/11/2021 – 11/11/2021,	410m east

Location Reference	Location description	Location Co-ordinates		Monitoring period	Approx. distance and direction from EfW CHP Facility Site boundary
		Latitude	Longitude		
				16/11/2021 – 17/11/2021	
ST2	Northern turning circle at end of Victory Road.	52’39'32”51"	0’ 9'22”30"	10/11/2021 – 12/11/2021, 16/11/2021 – 17/11/2021	1000m north
ST3	Near south-west corner of junction of Algores Way & Weasenham Lane.	52’39'14”92"	0’ 9'32”05"	10/11/2021 – 12/11/2021, 16/11/2021 – 17/11/2021	640m north-east
ST4	Near Cambian Wisbech School, Anglia Way.	52’39'1”19"	0’ 9'15”92"	10/11/2021 – 12/11/2021, 16/11/2021 – 17/11/2021	150m north-east
ST5 (Backup/Alternative)	South-eastern corner of Morrisons car park 30m northwest of nearest building at Elme Hall Hotel.	52’38'56”58"	0’10'21”85"	10/11/2021 – 12/11/2021, 16/11/2021 – 17/11/2021	140m east
ST6	On Meadowgate Lane, in lay by approximately 60m south of A47.	52’38'57”92"	0’10'51”40"	11/11/2021 – 12/11/2021, 17/11/2021 – 18/11/2021	2000m east
ST11	At 31 Broadend Road, approx. 15m north of the dwelling at 56 Broadend Rd and 60m west of the A47.	52’39'37”97"	0’11'37”11"	11/11/2021 – 12/11/2021, 17/11/2021 – 18/11/2021	3000m north-east

7.5 Baseline

7.5.1 To inform the assessments, representative baseline data describing the ambient noise environment in the vicinity of the nearest Receptors to the Proposed Development was acquired in November 2022 and processed in accordance with the agreed SMP, provided in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**. Details of the baseline surveys, including determination of representative sound levels to be used in the assessment of operational noise, and determination of appropriate thresholds of significance for construction noise in accordance with BS 5228-1:2009+A1:2014, are presented in the baseline monitoring report in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**.

7.5.2 The influence of COVID-19 on the measurement data was considered by comparison with monitoring data acquired in 2019 (prior to the pandemic) and with noise mapping data which indicates expected levels of road noise during daytime and night-time. The comparisons indicated that differences in sound levels were generally within ±3 dB, indicating that the 2021 monitoring data were not unduly affected by variations in local conditions due to the pandemic, and are therefore representative of current baseline conditions.

7.5.3 Baseline conditions in the vicinity of the nearest Receptors to the Proposed Development are considered typical of urban fringe areas affected by a mixture of industrial, commercial and transport sources.

Current baseline

EfW CHP Facility Site, CHP Connection, TCC, Access Improvements, Water Connections, Grid Connection

7.5.4 Baseline sound level data of Receptors closest to the construction noise sources associated with the Proposed Development were measured as part of the November 2021 survey campaign. Eight short-term monitoring locations, and three long-term monitoring locations were used.

7.5.5 The current sound climate is dominated by local road traffic, and industrial noise from the existing industrial area.

7.5.6 Baseline conditions in the vicinity of the nearest Receptors to the Proposed Development are considered typical of urban fringe areas affected by a mixture of industrial, commercial and transport sources.

7.5.7 There appears to be no significant sources of vibration that would entail high baseline levels of vibration in the area. There are some dwellings in close proximity to local highways where there are existing movements of heavy vehicles and where vibration may, at times, be perceptible.

Future baseline

7.5.8 In the absence of the Proposed Development, it is considered unlikely there would be any significant change in baseline conditions. However, it is understood that the area to the south-west of the EfW CHP Facility Site is allocated predominantly for

business purposes, though the Fenland Local Plan considers that there is some potential for residential development in the eastern half. Should the area immediately surrounding the EfW CHP Facility be developed, it is expected that baseline noise characteristics will become more industrial in nature.

EfW CHP Facility Site, CHP Connection, TCC, Access Improvements and Water Connections

7.5.9 The EfW CHP Facility Site, CHP Connection, TCC, Access Improvements, and Water Connections are located in an existing industrial area with numerous industrial and commercial sound sources present which are anticipated to remain in operation during the construction and operation of the Proposed Development. As noted above, the EfW CHP Facility Site does sit within, and adjacent to, an area indicated as a Broad Location for Growth in the Adopted Fenland Local Plan 2014. *Policy LP8 – Wisbech* states that the use of the land would be predominantly for business purposes and the indication is that these would be located in areas closest to the EfW CHP Facility Site. The overall characterisation of the baseline noise environment is unlikely to change significantly. That part of the Water Connections furthest away from the industrial area is close to the A47.

7.5.10 There are also plans to re-open the disused March to Wisbech Railway. This could introduce new noise sources into the area adjacent to the EfW CHP Facility, CHP Connection and Access Improvements.

Grid Connection

7.5.11 The nearby environs of the Grid Connection route are characterised by agricultural uses, adjacent to the busy A47 road. The area that would be affected by the Grid Connection is likely to remain in agricultural use. Changes in traffic flows in the absence of the Proposed Development are unlikely to affect baseline conditions, as proposals to implement the Wisbech Access Strategy (WAS) and improvements to the A47 would need to generate a significant uplift in vehicle numbers to give rise to a significant effect. At Elm High Road and Broadend Road junctions, CCC does have proposals to increase junction capacity. It is presently unclear as to when these will take place.

7.6 Scope of the assessment

Spatial scope

7.6.1 The spatial scope of the assessment of noise and vibration covers the area of the Proposed Development, and the Study Area described in **Section 7.4**.

Temporal scope

7.6.2 The temporal scope of the assessment of noise and vibration is consistent with the period over which the development would be carried out and therefore covers the construction and operational periods set out below.

7.6.3 Construction is scheduled to commence in 2023, and the Proposed Development would commence operation in 2026. The assessment has been based on the

construction programme set out in **Chapter 3: Description of the Proposed Development (Volume 6.2)**.

Potential Receptors

7.6.4 An initial desk-based review of the Proposed Development site and surrounding area was undertaken to identify potential human Receptors that could be subject to significant effects due to the construction and operation of the Proposed Development. As detailed in **Chapter 11: Biodiversity (Volume 6.2)**, no ecological Receptors sensitive to noise and vibration impacts have been identified.

7.6.5 The desk-based review focussed solely on human Receptors which are already extant within the Study Areas as described in **Section 7.4**.

7.6.6 The potential Receptor locations to be considered are provided in **Table 7.14 Potential noise sensitive Receptors**. The sensitivity of the Receptors, discussed below, are determined using experience from previous similar facilities and professional judgement. The sensitivities for the pertinent Receptor categories are set out in **Table 7.21 Establishing the sensitivity of Receptors.** In general, the closest Receptors to proposed construction and operational activities have been identified for inclusion within the assessment. This is on the basis that any adverse effects would be unlikely to be of greater magnitude at any Receptors which are further than the closest Receptors. In some cases, for completeness or where there are Receptors in close proximity to the boundary of the Study Area, Receptors that are further away, or just outside of the Study Area, have also been included in the assessment.

7.6.7 The sensitivity of all Receptors have been determined using professional judgement, as set out in **Table 7.21 Establishing the sensitivity of Receptors**. All dwellings identified in **Table 7.14 Potential noise sensitive Receptors** are considered to be of medium sensitivity to noise (including vibration) effects. Industrial and commercial Receptors adjacent to the EfW CHP Facility Site are considered to be of negligible sensitivity to noise and vibration effects. The Eye Clinic, is considered to be of high sensitivity to noise and vibration effects. However, it is considered that a relatively high absolute noise level would be required to result in any adverse impacts at the Eye Clinic, as all surgical procedures and/or consultations would be expected to be undertaken in a mechanically ventilated space in accordance with ventilation requirements. Therefore, openable windows will not be providing ventilation and hence the façade system at the Eye Clinic will be relatively high performance.

7.6.8 Other uses which could be considered to be of high sensitivity to noise and/or vibration effects are hospital operating theatres, recording studios and specialised vibration sensitive processes. The desk-based review identified no further Receptors of this type within the Study Area.

Table 7.14 Potential noise sensitive Receptors

ID	Receptor	Direction	Approximate distance from boundary of works /activities
Dwellings nearest to the EfW CHP Facility Site, CHP Connection and associated construction activities, including Access Improvements and provision of Water Connections			
R1	2 New Bridge Lane	south-west	5m
R2	9 New Bridge Lane	south-west	20m
R3	10 New Bridge Lane	south	20m
R4	Dwelling known as 'Potty Plants' off New Bridge Lane, north of the A47	south	340m
R5	Newbridge Lane Caravan Park	south	400m
R6	Oakdale Place Caravan Site	south	500m
R7	The Chalet, New Drove	south-east	350m
R8	125 New Drove	east	500m
R9	93 South Brink	west	550m
R10	97 South Brink	west	550m
R11	25 Cromwell Road	west	550m
R12	27 – 37 Cox Close	north-west	450m
R13	23 Victory Road	north	900m
R14	Bruce Close	north-east	1000m
R15	50 – 60 Weasenham Lane	north-east	850m
Non-residential Receptors nearest to the EfW CHP Facility Site, CHP Connection and associated construction activities, including Access Improvements and provision of Water Connections			
R16	BJ Books Ltd, Algores Way	north-east	20m
R17	DHL, 11 Salters Way	north	10m
R18	Welbourns of Wisbech Ltd, 3 New Bridge Lane	south	15m
R19	Kirk Coachworks, New Bridge Lane	south	20m
R20	Thurlow Nunn, 14 Cromwell Road	west	20m
R21	Tesco Filling Station, Cromwell Road	north	30m

ID	Receptor	Direction	Approximate distance from boundary of works /activities
R22	James Mackle (UK) Ltd, Algores Way	east	30m
R23	Industrial Operation, Boleness Road	east	30m
R24	Fountain Frozen Ltd, Salters Way	west	60m
R25	The Anglia Community Eye Service Clinic, 32 Cromwell Road	west	400m
R51	Floorspan Contracts, Unit 1, Europa Way	north	20m
R52	Hair World UK Ltd, Algores Way	east	30m
R53	The Builders Yard, rear of 9 New Bridge Lane	west	20m
Educational Receptors nearest to the EfW CHP Facility Site and associated construction activities			
R26	TBAP Unity Academy, Algores Way /Weasenham Lane	north-west	620m
R27	Cambian Education Foundation Learning Centre, Anglia Way	north-west	200m
R28	Thomas Clarkson Academy	north-west	750m
Receptors on vehicular access route			
R1	2 New Bridge Lane	south-west	5m
R2	9 New Bridge Lane	south-west	20m
R3	10 New Bridge Lane	south	20m
R29	64 Weasenham Lane	north	10m
R30	66 Weasenham Lane	north	10m
Receptors nearest to the CHP Connection			
R31	15 Hillburn Road	east	5m
R32	16 Hillburn Road	east t	5m
R33	16a Hillburn Road	east	5m
R34	24 Burdett Road	east	10m
R35	5 Great Eastern Road	east	10m
R36	1 Oldfield Lane	west	55m

ID	Receptor	Direction	Approximate distance from boundary of works /activities
R37	3 Oldfield Lane	west	60m
R38	25 Victory Road	east	5m
R39	27 Victory Road	east	5m
R50	21 Cromwell Road	west	260m
Receptors nearest to the Grid Connection Route			
R2	9 New Bridge Lane	north-west	100m
R3	10 New Bridge Lane	south	30m
R4	Dwelling known as 'Potty Plants' off New Bridge Lane, north of the A47	south	30m
R5	Newbridge Lane Caravan Park	south	30m
R44	52 Broadend Road	south	20m
R45	56 Broadend Road	south-east	50m
R46	Elme Hall Hotel	north	30m
R47	85 Elm High Road	south	60m
R48	36 Elmfield Drive	south	130m
R49	Oxburgh Cottage, Meadowgate Lane	south	100m
Receptors near to Grid Connection at Walsoken Substation			
R44	52 Broadend Road	east	20m
R45	56 Broadend Road	east	50m

7.6.9 With regard to the Eye Clinic, it has been agreed during Stakeholder consultation, that baseline monitoring at this location is not required. This is on the basis that baseline data obtained at a nearby survey location would be considered representative, and that potential impacts at this Receptor are primarily determined using predicted absolute levels of noise and vibration.

Likely significant effects

Construction noise

7.6.10 Significant effects due to construction noise may occur during core construction hours at the nearest Receptors adjacent to all works associated with the construction of the Proposed Development and commissioning and testing. Core construction hours for the Proposed Development are set out in **Section 3.7** of **Chapter 3: Description of the Proposed Development (Volume 6.2)**. Information is also provided on the limited number of works which might take place outside of these hours. Construction works outside of the core hours may give rise to significant effects. Therefore, works out of core hours works which are planned in advance (as opposed to emergency) and which are external (i.e., outside new buildings or buildings constructed as part of the Proposed Development) and have the potential to give rise to significant noise emissions will be agreed with the relevant local authorities under the process for agreeing out of core hours works set out in the **Outline CEMP (Volume 7.12)**, secured through the DCO, either through seeking written agreement from the relevant local authorities or through Section 61 (s61) consents.

7.6.11 The Access Improvements, CHP Connection, Grid Connection, and Water Connections are linear works. As such, worst-case noise levels due to these works will be limited to periods when they are in closest proximity to specific Receptor locations.

7.6.12 The Access Improvements are in close proximity to nearby residential and non-residential Receptors on New Bridge Lane.

7.6.13 The CHP Connection consists of three phases: site clearance, foundations and pipeline installation. As access to the CHP Connection route will be limited it is anticipated that works would be undertaken in a linear, sequential fashion. This removes the potential for intensive works to be undertaken at any one location for an extended period.

7.6.14 The Grid Connection design includes open trench construction. The majority of the works are located along the A47 and will be undertaken during evenings/nights to minimise impacts to road traffic. Works will be undertaken as rapidly as possible to further minimise impacts to road traffic. As such, worst-case noise levels would be expected to occur over only one or two evenings/nights over each 300m section.

7.6.15 The potable Water Connections requires some underground sections, across the A47, which may be constructed using open trench or HDD (see **Section 3.10** of **Chapter 3: Description of the Proposed Development (Volume 6.2)**). Noise from HDD activities may have the potential to give rise to significant adverse effects, particularly at night-time, as mud pumps are usually required to be operated 24 hours a day to ensure the drilled route does not collapse. The anticipated duration of the HDD programme is approximately three weeks. Alternatively, an open trench method may be used. The anticipated duration of the open trench option is approximately two evenings/nights.

7.6.16 The likely effects associated with the commissioning and testing phase are expected to be similar to those during the operational phase, albeit with a lesser duration of

nine months. In the first two months of commissioning and testing at the EfW CHP Facility Site, during the daytime, there would be some construction works ongoing. In the final six months of commissioning and testing, activities would be limited to commissioning and testing only. During commissioning and testing, some steam venting will be required which may be audible at off Site locations. However, steam vents will have silencers fitted, and whilst steam venting may be audible, it is anticipated that the average sound levels over the commissioning and testing phase would not exceed the predicted operational sound levels.

7.6.17 Works at, and in the vicinity of, the EfW CHP Facility Site are extensive, occurring over the duration of the construction programme. Nearby Receptors may be affected by works on other development components which overlap with construction activity on the EfW CHP Facility Site.

Construction vibration

7.6.18 Percussive piling does not form any part of the Proposed Development. CFA will be the piling method utilised. Consequently, significant construction vibration effects due to the construction of the EfW CHP Facility are unlikely.

7.6.19 During construction of the Access Improvements, vibratory rollers will be used for compaction. This activity could give rise to levels of vibration that may be perceptible at the nearest dwellings.

Construction traffic noise

7.6.20 Significant effects due to construction traffic noise may occur at the nearest Receptors adjacent to the vehicular routes associated with the construction of the Proposed Development.

7.6.21 In accordance with the guidance on Study Areas at paragraph 3.8 of DMRB LA 111, the Study Area for construction traffic noise impacts is defined as 50m from the kerb of any road with a predicted increase in Basic Noise Level (BNL) of at least 1 dB(A), which is considered to be the minimum perceivable increase in noise to the human ear.

7.6.22 Assessments of the increase in BNL are presented below. Only those road links within the Study Area where a significant proportion of construction traffic will be routed are considered. Predicted increases in BNL are presented in **Table 7.15 Predicted construction phase increase in traffic noise**.

Table 7.15 Predicted construction phase increase in traffic noise

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2024 baseline + construction traffic)	% HGV (2024 baseline + construction traffic)	Predicted Traffic Noise Increase, dB
Algores Way	2804	6.8	3421	7.7	1.1

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2024 baseline + construction traffic)	% HGV (2024 baseline + construction traffic)	Predicted Traffic Noise Increase, dB
New Bridge Lane	705	22.2	856	34.1	2.0
Cromwell Road ***(A47 to New Bridge Lane)***	14116	6.0	15858	6.6	0.7
Cromwell Road ***(New Bridge Lane to Weasenham Lane)***	13580	5.9	15053	5.8	0.4
Cromwell Road ***(Weasenham Lane to Town Bridge)***	14130	4.1	15263	4.0	0.3
Weasenham Lane ***(Cromwell Road to Algores Way)***	10634	5.2	11617	5.3	0.4
Weasenham Lane ***(Algores Way to Elm High Road)***	11526	5.0	12502	4.9	0.3
A1101 Elm High Road	18442	5.5	19571	5.5	0.3
Churchill Road	15211	6.8	16344	6.7	0.3
A47 ***(Cromwell Road to Guyhirn)***	22184	9.2	23682	9.7	0.4
A47 ***(Cromwell Road to Elm High Road)***	18596	8.9	19310	9.3	0.2
A47 ***(Elm High Road to Lynn Road)***	17525	8.4	18766	8.6	0.3
A47 ***(Lynn Road to A17)***	22982	6.6	24393	6.8	0.3
A1101 Elm High Road ***(S of A47)***	18296	3.9	18972	4.0	0.2
A1101 ***(S of Church Lane)***	11266	6.8	11690	7.0	0.2

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2024 baseline + construction traffic)	% HGV (2024 baseline + construction traffic)	Predicted Traffic Noise Increase, dB
Church Lane *(E of A1101)*	2877	2.6	2980	2.7	0.2
Broadend Road *(E of A47)*	1557	3.1	1618	3.2	0.2
Broadend Road *(W of A47)*	2069	3.2	2147	3.3	0.2

7.6.23 The results in **Table 7.15 Predicted construction phase increase in traffic noise** indicate that predicted increases in the BNL in excess of 1 dB, due to traffic associated with the construction of the Proposed Development, may occur on New Bridge Lane and Algores Way. Based on this, an assessment of construction traffic has been undertaken using the short-term criteria in DMRB LA 111, according with the temporal extent of the construction phase, which is short-term.

Vehicle induced vibration

7.6.24 It was noted by the PINS in the EIA Scoping Opinion[35] that insufficient information had been provided to support scoping out of potential vibration impacts due to vehicle induced vibration.

7.6.25 However, Section 1.4 of DMRB LA 111 states (with regard to potential operational vibration impacts from road schemes) that:

"Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects."

7.6.26 The primary mechanism for heavy vehicles to give rise to vibrations is the movement of the vehicles over irregularities in the road surface.

7.6.27 The highways authority has a duty to undertake regular inspection and maintenance of the local highway network. Maintenance of the local highway network is outside of the control of the Applicant.

7.6.28 Road surfaces at the EfW CHP Facility Site will be subject to regular maintenance and inspection.

7.6.29 On the basis of the above, quantitative assessment of potential effects due to construction and operational vibration induced by traffic movements has been scoped out of the assessment.

[35] The Planning Inspectorate. Scoping Opinion: Proposed Medworth Energy from Waste Combined Heat and Power Facility. Case Reference: EN010110. January 2020.

7.6.30 Notwithstanding the above, the potential for adverse effects due to vehicle induced vibration has been considered qualitatively for Receptors on New Bridge Lane where Receptors would be in close proximity to a significant increase in heavy vehicle movements during the construction and operational phases.

Operational noise

7.6.31 Significant effects due to operational noise may occur due to noise emissions from fixed plant, and due to traffic generation, i.e., deliveries of waste to the EfW CHP Facility. The major plant and processes are described in **Section 3.5** of **Chapter 3: Description of the Proposed Development (Volume 6.2)**. The assessment of operational noise takes into account all noise sources at the EfW CHP Facility which have the potential to give rise to significant effects, including but not limited to:

- Anticipated flows of vehicles within the EfW CHP Facility Site boundary, and, on New Bridge Lane where vehicle flows will consist solely of waste delivery vehicles, vehicles delivering lime, urea and Activated Carbon (AC) and vehicles exporting Air Pollution Control residues (APCr) and Incinerator Bottom Ash (IBA);
- Significant external fixed plant items such as the Air-Cooled Condensers (ACC's) and chimney outlet;
- Breakout noise from internal plant and activities;
- Loading of vehicles with APCr and IBA;
- Lime, urea and AC deliveries;
- Steam venting during start up and shut down; and
- Emergency sources – pressure relief valves on roof of boiler house and an emergency diesel generator.

7.6.32 Other than the sound generated by the associated vehicle movements, sound generated by the loading of vehicles with IBA and APCr and by the delivery of lime, urea and AC is not included in the prediction of the specific sound level from the EfW CHP Facility. This is on the basis that these activities will occur in enclosed or significantly screened areas and will therefore not have the potential to generate any significant noise emissions.

7.6.33 Operational traffic noise on New Bridge Lane between Salters Way and the proposed EfW CHP Facility Site access are included in the assessment of operational noise, to provide a robust and worst-case approach. The reason for this approach is that it accords with the scope of the British Standard for assessing industrial and commercial sound (BS 4142). BS 4142 Section 1: Scope states that the methods provided in the standard include assessment of *"sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from the premises or processes, such as that from fork-lift trucks, or that from train or ship movements on or around an industrial and/or commercial site."*. As the vehicle movements on the section of New Bridge Lane between Salters Way and the proposed Site access will consist solely of vehicle movements to the EfW CHP Facility, it is considered that these are intrinsic to the operation of the facility and should be considered as part of the BS 4142 assessment. This approach provides

a robust and worst-case assessment because the assessment methods and criteria used in the assessment of operational noise are, generally, more stringent than those used in the assessment of road traffic noise.

7.6.34 Substation plants often have sources which have the potential to give rise to significant adverse noise impacts. NPS EN-5 Section 2.9 provides advice and guidance on the approaches to be taken to assessing operational noise arising from electricity connections. However, in this case, the plant being installed at the Walsoken Substation is essentially restricted to new switchgear. Information on the switchgear and ancillary plant items required at the substation indicates that the equipment will result in no significant noise emissions and that any noise emitted by the equipment would not be audible at the nearest Receptor locations. There is, therefore, no potential for significant effects to occur due to operational sound from equipment at the substation.

7.6.35 In exceptional circumstances, changing the electrical load within a substation may cause additional noise from existing plant at the substation. In such circumstances, the operator and the DNO would investigate, and, where a significant change in noise was identified, carry out mitigation works.

Operational vibration

7.6.36 There are no significant sources of operational vibration proposed at the EfW CHP Facility, CHP Connection or Grid Connection. As such, it is unlikely that any effects, significant or otherwise, would arise due to operational vibration, either from fixed or mobile plant or any activity occurring at the Proposed Development, with the exception of heavy vehicle movements in very close proximity to residential Receptors on New Bridge Lane where there are currently minimal or no heavy vehicle movements, as discussed above.

7.6.37 Therefore, operational vibration effects from fixed or mobile plant at the EfW CHP Facility, CHP Connection or Grid Connection are scoped out of the assessment. This approach is confirmed by the EIA Scoping Opinion, where commentary around operational vibration focusses solely on operational vehicle movements, and no commentary is provided on operational vibration arising from the EfW CHP Facility, CHP Connection or Grid Connection.

Operational traffic noise

7.6.38 There will be increases in road traffic during the operational phase of the development when compared to the current baseline. The same criteria and approach to the Study Area as applied to construction traffic noise is also applied to the assessment of operational traffic noise in the expected opening year (2026). Potential long-term impacts are assessed, for a future year, using the long-term criteria from DMRB LA 111. Operational traffic noise on New Bridge Lane between Salters Way and the proposed site access are assessed using a different methodology. As such, changes to BNL on New Bridge Lane only apply between Cromwell Road and Salters Way.

7.6.39 Typically, the future year considered is 15 years after the opening year of the Proposed Development, though other future years (5 years after opening, 10 years after opening) are sometimes considered. Though long-term traffic data was

unavailable, the number of vehicle movements associated with the operation of the Proposed Development are anticipated to remain constant. As such, it is expected that assessment of the future year scenario will likely indicate similar, or reduced, effects, as compared to the assessment of short-term impacts in the opening year, due to normal growth in traffic flows on the local highway network.

7.6.40 Assessments of the increase in BNL are presented below. Only those road links within the study where a significant proportion of operational traffic will be routed are considered. The assessment considers all traffic out of the EfW CHP Facility via New Bridge Lane. Predicted increases in BNL are presented in **Table 7.16 Predicted operational increase in traffic noise**.

Table 7.16 Predicted operational increase in traffic noise

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2024 baseline + construction traffic)	% HGV (2024 baseline + construction traffic)	Predicted Traffic Noise Increase, dB
Algores Way	2804	6.8	3079	6.8	0.4
New Bridge Lane ***(Salters Way to Cromwell Road)***	705	22.2	1038	44.0	3.6
Cromwell Road ***(A47 to New Bridge Lane)***	14116	6.0	16233	7.2	0.9
Cromwell Road ***(New Bridge Lane to Weasenham Lane)***	13580	5.9	15398	5.6	0.5
Cromwell Road ***(Weasenham Lane to Town Bridge)***	14130	4.1	15637	4.1	0.5
Weasenham Lane ***(Cromwell Road to Algores Way)***	10634	5.2	11727	4.9	0.3
Weasenham Lane ***(Algores Way to Elm High Road)***	11526	5.0	12717	5.0	0.4
A1101 Elm High Road	18442	5.5	20120	5.6	0.4
Churchill Road	15211	6.8	16787	6.8	0.4
A47 ***(Cromwell Road to Guyhirn)***	22184	9.2	24477	10.1	0.6
A47	18596	8.9	19952	9.4	0.4

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2024 baseline + construction traffic)	% HGV (2024 baseline + construction traffic)	Predicted Traffic Noise Increase, dB
(Cromwell Road to Elm High Road)					
A47 ***(Elm High Road to Lynn Road)***	17525	8.4	19291	8.6	0.4
A47 ***(Lynn Road to A17)***	22982	6.6	25126	6.7	0.4
A1101 Elm High Road ***(S of A47)***	18296	3.9	19614	4.2	0.4
A1101 ***(S of Church Lane)***	11266	6.8	12089	7.2	0.4
Church Lane ***(E of A1101)***	2877	2.6	3079	2.7	0.3
Broadend Road ***(E of A47)***	1557	3.1	1667	3.2	0.3
Broadend Road ***(W of A47)***	2069	3.2	2214	3.3	0.3

7.6.41 The results in **Table 7.16 Predicted operational increase in traffic noise** indicate that predicted increases in the BNL in excess of 1 dB, due to traffic associated with the operation of the Proposed Development, will occur on New Bridge Lane. On this basis, assessments of potential short-term and long-term impacts have been undertaken using the criteria in DMRB LA 111.

Effects scoped-in to the assessment

7.6.42 The potentially significant effects relating to the Proposed Development are summarised below:

- **Construction vibration** – Use of vibratory rollers for the Access Improvements which may occur within 100m of any residential vibration sensitive Receptor;
- **Construction noise** – Construction activities associated with all aspects of the Proposed Development;
- **Construction traffic noise** – Increases in flows of traffic on the vehicular access route;
- **Construction traffic vibration** – Qualitative assessment of potential increase in levels of vehicle induced vibration at Receptors on New Bridge Lane due to increased HGV movements associated with the construction phase;

- **Operational noise –** Noise emissions from the EfW CHP Facility, including movements of HGVs on the stretch of New Bridge Lane between the Salters Way junction and the proposed site access;
- **Operational traffic noise** – Increases in flows of traffic on the local highway network due to HGV movements associated with the operation of the EfW CHP Facility Site; and
- **Operational traffic vibration** – Qualitative assessment of potential increase in levels of vehicle induced vibration at Receptors on New Bridge Lane due to increased HGV movements associated with the operational phase.

Effects scoped-out of the assessment

7.6.43 The following potential effects are not likely to be significant and are therefore scoped out of the assessment:

- As agreed with the Stakeholders, and based on the EIA Scoping Opinion (as discussed in paragraph 7.6.37), there are no proposed significant sources of operational vibration associated with operational plant and activities at the EfW CHP Facility, Grid Connection or CHP Connection. Therefore, quantitative assessment of operational vibration effects are scoped out of the assessment.

Receptors scoped in and scoped out of the assessment

7.6.44 The noise and vibration Receptors that have been taken forward for assessment are the majority of the potential Receptors listed above in **Table 7.14 Potential noise sensitive Receptors**, with a limited number of exceptions as detailed below, where assessment at closer Receptors will ensure appropriate control of adverse effects at those which are scoped out.

7.6.45 Generally, the closest Receptors to the Proposed Development will experience the highest noise levels. It is considered that these Receptors represent a worst-case in terms of noise impact. In some cases, for completeness or where there are Receptors in close proximity to the boundary of the Study Area, Receptors that are further away, or just outside of the Study Area, have also been included in the assessment.

7.6.46 As agreed by PINS in the EIA Scoping Opinion, detailed in **Table 7.1 Summary of EIA Scoping Opinion responses for noise and vibration,** the following Receptors have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant:

- Dwellings further away from the EfW CHP Facility Site to the northwest, north and northeast are scoped out of the assessment of construction and operational effects arising from the EfW CHP Facility Site. This is on the basis that these Receptors are a significant distance from the EfW CHP Facility Site, with many intervening structures which would serve to attenuate noise emissions. Assessment at the closer Receptors will ensure appropriate control of noise emissions at those Receptors which have been scoped-out.

7.6.47 The noise and vibration Receptors impacts scoped out from being subject to further assessment because the potential effects are not considered likely to be significant

are summarised in **Table 7.17 Noise and vibration Receptors scoped out of further assessment.**

Table 7.17 Noise and vibration Receptors scoped out of further assessment

Receptor	Impact	Justification	Agreement
27 to 37 Cox Close, 23 Victory Road, Bruce Close, 50 – 60 Weasenham Lane, 64 & 66 Weasenham Lane.	Construction and operational effects.	Assessment at closer Receptors will ensure appropriate control of effects at these Receptors also. However, 125 New Drove was scoped into the assessment of operational noise as representative baseline data was obtained for this location.	Agreed by PINS in the EIA Scoping Opinion, Section 4.2.3. However, 125 New Drove was scoped into the assessment of operational noise as representative baseline data was obtained for this location.

7.7 Embedded environmental measures

7.7.1 A range of environmental measures to control operational noise have been embedded into the Proposed Development and measures to control construction noise and vibration are stated in the **Outline CEMP (Volume 7.12)**, which will be secured by DCO Requirement. **Table 7.18 Summary of the embedded environmental measures and how these influence the noise and vibration assessment** outlines how these embedded measures will influence the noise and vibration assessment.

Table 7.18 Summary of the embedded environmental measures and how these influence the noise and vibration assessment

Receptor	Changes and effects	Embedded measures and influence on assessment
Receptors near to construction activities	Potential adverse effects associated with construction noise and vibration.	Undertaking construction in accordance with good practice. All construction activities to be undertaken within normal working hours for construction, except in circumstances listed in **Chapter 3: Description of the Proposed Development (Volume 6.2)**. Any external out of core hours works which are planned in advance (as opposed to emergency) which are external (i.e., outside new buildings or buildings constructed as part of the Proposed Development) and which have the potential to give rise to significant noise emissions will be agreed with the relevant local authorities through the process set out in the CEMP, consistent with the **Outline CEMP (Volume 7.12)** either through written agreement or through the application for s61 consents. If there is a

Receptor	Changes and effects	Embedded measures and influence on assessment
		requirement for HDD of the Water Connections across the A47, night-time works may be needed. Where the potential for significant effects arises, applying BPM in accordance with the recommendations in BS 5228:1-2009+A1:2014.
Receptors near the EfW CHP Facility	Potential increase in ambient noise levels due to the operation of fixed and mobile plant, including on-site vehicle movements.	During normal operations, limitation of hours of delivery of waste from 0700 to 2000 hours. There may be some occasions when waste deliveries are accepted outside the normal opening hours, for example in the case of an emergency or to accommodate the delivery of waste where vehicles have been unavoidably delayed, or in other similar circumstances. Proposed timing of deliveries and other on-site activities accounted for in the assessment. Control of noise emissions from major process buildings by the building fabric and appropriate specification of noise attenuating louvres and vents, which will be designed to ensure noise emissions do not significantly contribute to off-site noise levels. Proposed building construction accounted for in modelling and prediction of specific sound levels. Selection of plant, and engineered noise control, where required, to control any tonal noise emissions such that the specific sound at any noise sensitive Receptors are broadband in character. When not in use, all tipping hall doors will remain closed. Steam vents to be fitted with silencers. The plant design and selection has been specified so that noise emissions will be limited.
Receptors near the EfW CHP Facility	Potential increase in ground-borne vibration due to HGV movements.	All on-site roads within the EfW CHP Facility Site will be subjected to regular inspection and maintenance. Any surface irregularities will be promptly remediated to ensure ground-borne vibration emissions due to HGV movements are controlled.

7.8 Assessment methodology

7.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to the EIA (Volume 6.2)**, and specifically in **Sections 4.7 to**

4.10. However, whilst this has informed the approach that has been used in this noise and vibration assessment, it is necessary to set out how this methodology has been applied to address the specific needs of this noise and vibration assessment.

7.8.2 Noise impact assessments for construction and operational phases have been conducted in accordance with the relevant standards (BS 5228-1 and BS 4142) and guidance. 3-dimensional noise propagation models have been produced in SoundPLAN v8.2 noise modelling software to predict construction and operational noise levels. The prediction methodology implemented in the noise model is that provided in ISO 9613-2:1996 as described in **Section 7.3**.

7.8.3 The assessment of construction noise and vibration effects have been undertaken with reference to BS 5228-1:2009+A1:2014 and BS 5228-2:2009+A1:2014 respectively on the basis of the information provided and the representative baseline sound levels.

Construction noise

7.8.4 Construction noise and vibration levels have been predicted based on the construction schedule and information on the specified plant requirements (see **Chapter 3: Description of the Proposed Development (Volume 6.2)**. The full data applied for each construction activity is shown in **Appendix 7B Construction Noise Assessments (Volume 6.4)**. Locations of the construction plant are shown in **Figures 7.9 – 7.12 (Volume 6.3)**. A summary of the total sound power levels accounting for the plant requirements and plant on-times is shown in **Table 7.19 Summary of construction assessment input data.** Noise levels during commissioning and testing are expected to be similar to those during the operational phase. The predicted operational sound levels provided in **Appendix 7C Operational Noise Assessment Data (Volume 6.4)** have been used to inform the assessment of likely significant effects during commissioning and testing.

Table 7.19 Summary of construction assessment input data

Construction activity	Activity description	Total sound power, dBA L_W
TCC, mobilisation	Stripping off and storing of topsoil, installing geotextile matting, 300m of compacted hardcore, 100mm of compacted type 1.	116
TCC & EFW CHP Facility Site mobilisation	Construction compound including offices, stores, car parking, utility set up, boundary creation and access arrangements from Algores Way. Demolition of existing waste transfer building and any other structures.	119
TCC activity, daytime (first 5 months)	Diesel generators for power supply prior to mains connection. Telescopic handler moving materials.	108
TCC activity, daytime (all months after month 5)	Telescopic handler moving materials.	99

Construction activity	Activity description	Total sound power, dBA L_W
TCC, night-time (first 5 months)	Diesel generators for power supply prior to mains connection.	108
Access Improvements	Road works on New Bridge Lane.	114
Water Connections (daytime - all plant, night-time - pumps and generators only)	HDD under A47.	Day: 122 Night: 109
Water Connections	Open trench through A47 (worst-case activity – sawing road surface).	107
EfW CHP Facility Site earthworks	Earthworks and piling using CFA method, dewatering (if required), waste bunkers created via piled retaining walls, material excavated from bunkers re-used on site where possible.	122
EfW CHP Facility Site foundations	Concrete Pour for EfW foundation and hardstandings.	108
EfW roads and hardstandings	Grading of roads and hardstandings will be required to provide a constant grade across site.	113
EfW CHP Facility Site structures (Civil)	Grading of roads and hardstandings will be required to provide a constant grade across site.	116
EfW CHP Facility Site M&E	Installation of mechanical and electrical equipment.	117
EfW CHP Facility Site M&E - out of core hours construction activity	Installation of mechanical and electrical equipment.	112
EfW CHP Facility Site plant Installation	Installation of grate and boiler works, ACC, turbine, water treatment plant and APC system.	113
CHP site clearance	Vegetation clearance.	117
CHP foundations	Foundations will be constructed using a method that will be determined post consent in the detailed design. Will not involve percussive piling.	118
CHP install	Steel framework for pipeline.	113
CHP install, Weasenham Lane crossing	Steel framework for pipeline then constructed.	114
Grid Connection: cable install (along A47)	Cable installed by open cut trenching.	113
Grid Connection: cable install (EfW CHP Facility Site to A47 & A47 to Walsoken Substation)	Cable installed by open cut trenching.	111

Construction activity		Activity description	Total sound power, dBA L_W
Walsoken connection	**Substation**	Soil strip, earth bund, concrete pads, crane in equipment, landscaping.	107

Construction vibration

7.8.5 The assessment of vibration effects has been undertaken qualitatively based on consideration of the construction activity with the greatest potential to give rise to vibration emissions, which is the use of vibratory rollers during works on the Access Improvements. Use of vibratory rollers would be limited in terms of duration, but could be in close proximity to a number of residential and non-residential premises.

Operational noise

EfW CHP Facility

7.8.6 The assessment of operational effects due to site noise at dwellings has been assessed using the methodology provided in BS 4142:2014+A1:2019, on the basis of the information provided on operational noise sources, the predicted specific sound levels and the representative baseline sound levels. Details of the baseline monitoring and determination of the representative baseline sound levels are provided in **Appendix 7A Baseline Monitoring Report (Volume 6.4)**.

7.8.7 The input data and propagation calculations used to predict specific sound levels due to the operation of the EfW CHP Facility are provided in **Appendix 7C Operational Noise Assessment Data (Volume 6.4)**. Locations of noise sources considered in the assessment are shown in **Figure 7.15 Noise Model Input: EfW CHP Facility, operational scenario (Volume 6.3)**.

7.8.8 Specific sound levels due to fixed and mobile plant at the EfW CHP Facility have been predicted according to the method provided in ISO 9613-2:1996 and transport data indicating the expected numbers of waste deliveries provided in **Chapter 6: Traffic and Transport (Volume 6.2), Appendix 6B Transport Assessment, Section 6.3 Operational Phase Proposed Development Details (Volume 6.4)**.

7.8.9 The noise model used to predict specific sound levels generally assumes flat, acoustically mixed ground, but includes topography data for an area 100m beyond the boundary of the EfW CHP Facility Site. Ground at the EfW CHP Facility Site is assumed to be acoustically hard. Existing buildings, outside the EfW CHP Facility Site, have been included. Specific sound levels have been predicted at ground floor and first floor level, and the greater of the two have been used in the assessment, except at R3, R5, R6 and R7, as these Receptors are single storey and hence only ground floor level predictions are used at these Receptors.

7.8.10 The assessment of operational noise effects at commercial and industrial Receptors has been undertaken with reference to the predicted operational noise levels and ambient noise level criteria provided in BS 8233 and BS 5228-1.

7.8.11 For residential Receptors, the assessment is undertaken in accordance with BS 4142:2014+A1:2019. An initial estimate of impact is first undertaken which compares the predicted specific sound levels, combined with any rating penalties to account for the character of the specific sound, with the representative baseline residual and background sound levels. Following the initial estimate of impact, contextual aspects are considered. The final assessment result, and determination of significance, is dependent on consideration of context.

7.8.12 With regard to the consideration of context, BS 4142 states:

"Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following:

1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it. …"

7.8.13 To inform consideration of context, a noise change assessment has been undertaken. The criteria for increases in ambient noise are based on guidance contained in *'Guidelines for environmental noise impact assessment'* and are provided in **Table 7.20 Magnitude of ambient noise changes**. A change in sound level of +3 dB is considered to be a just noticeable change, for the majority of the population, for sounds of a similar character. As such, increases of up to +2 dB will tend to be imperceptible. On this basis, increases of 0 dB (i.e., no ambient noise increase) indicate an impact of negligible magnitude, increases up to +2 dB are considered to indicate an impact of low magnitude, increases between +3 to +5 dB indicate an impact of medium magnitude and increases equal to, or in excess, of +6 dB indicate an impact of high magnitude.

Table 7.20 Magnitude of ambient noise changes

Indicative magnitude	Noise change, dB	Description
Negligible	0	No increase in ambient noise levels.
Low	+1 to +2	Increase in ambient noise level tending to be imperceptible.
Medium	+3 to +5	Perceptible ambient noise level increase.
High	>= +6	Perceptible and noticeable increase in ambient noise level.

7.8.14 Where the assessment identifies the requirement for any additional mitigation measures, all relevant calculations and assumptions have been provided. Mitigation measures are described in **Section 7.10**.

Traffic noise (construction and operation)

7.8.15 Assessment of construction traffic noise considers the month when flows of construction vehicles are anticipated to peak: month 14 of the construction programme, which is proposed to occur in 2024. Assessment of operational traffic noise considers the normal operation of the EfW CHP Facility once maximum throughput of 625,600 tonnes has been reached, which is expected to occur in 2027.

Airborne noise

7.8.16 The assessment of effects due to increases in traffic noise from construction and operational traffic has been based on the predicted change in BNL, calculated in accordance with CRTN.

7.8.17 The traffic flow data used to inform the assessment are the same data upon which the assessments provided in **Chapter 6: Traffic and Transport (Volume 6.2)** are based. The noise assessment uses 18-hour flow data and Annual Average Weekday Traffic (AAWT). The Transport Assessment does not report this dataset, but it is factored from the data using the reported Annual Average Daily Traffic (AADT) flows as a basis.

7.8.18 Road links which are predicted to have vehicle flows falling below the CRTN low flow criteria (less than 50 vehicles an hour or less than 1000 vehicles in an 18-hour day) are subject to some uncertainty. CRTN states that *'Calculations of noise level for traffic flows below 50 veh/h or 1000 veh/18-hour day are unreliable and measurements should be taken when evaluating such cases.*'

7.8.19 The uncertainty associated with low flow road links cannot be addressed via measurement because the assessment scenarios are in the future. However, the inherent uncertainty associated with low flow links (New Bridge Lane from Cromwell Road to Salters Way, in the baseline year) is addressed below.

7.8.20 The primary concern for increases in road traffic noise on New Bridge Lane are the residential Receptors, as the industrial and commercial Receptors are unlikely to be subject to significant effects due to increases in road noise. 2 New Bridge Lane (R1) is less than 100m from Cromwell Road, where baseline flows of traffic are

approximately 20 times greater than on New Bridge Lane. Predictions of traffic noise levels from the two roads at R2 accounting for vehicle flows, speeds, %HGV, angle of view and propagation distance indicate that the $L_{A10,18h}$ traffic noise level from Cromwell Road is around 5 dB above that from New Bridge Lane. As such, predicted noise increases considered at R2 due to increases of vehicles on New Bridge Lane, which are subject to uncertainty due to low flow in the baseline year, will be considered in the context that the dominant source of road noise is traffic on Cromwell Road, where significant flows of traffic are present. This applies during both the construction and operational phases.

7.8.21 There is a similar low flow issue with the baseline scenario at 9 and 10 New Bridge Lane (R2 and R3, respectively) where there is currently zero traffic flow between the proposed EfW CHP Facility Site access and Salters Way.

7.8.22 For R2 and R3, traffic noise change is not assessed during the construction phase because the construction noise levels from construction activities at, and in close proximity to, the EfW CHP Facility Site are predicted to significantly exceed those from road traffic, by up to around 20 dB. Therefore, whilst individual vehicle movements may be audible at R2 and R3, these would not significantly contribute to the ambient noise environment when compared with the contribution from nearby construction activities.

7.8.23 For R2 and R3, traffic noise change is not assessed during the operational phase. This is because vehicle movements associated with the operation of the EfW CHP Facility between the junction of New Bridge Lane and Salters Way and the site access have been included in the operational EfW CHP Facility noise model. Noise from vehicle movements associated with the operation of the EfW CHP Facility are therefore included in the assessment of operational noise. This approach is in accordance with the scope of the relevant British Standard. This approach provides a robust and worst-case assessment because the assessment methods and criteria used in the assessment of operational noise are, generally, more stringent than those used in the assessment of road traffic noise.

Groundborne noise (vehicle induced vibration)

7.8.24 The guidance document which contains the criteria used for the assessment of airborne noise (DMRB) scopes out assessment of vehicle induced vibration (for new roads), as the road surface will be free from irregularities that would give rise to vehicle induced vibration.

7.8.25 There are no specific and accepted methods contained in any relevant technical guidance, policy or standards for predicting vehicle induced vibration.

7.8.26 However, there will be a significant increase in HGV movements on New Bridge Lane during the construction and operational phases.

7.8.27 As such, a qualitative assessment will be undertaken for Receptors on New Bridge Lane which will consider the sensitivity of the Receptor, the proximity of the Receptor to the carriageway edge, the increase in HGV movements and the likelihood for of significant effects based on the above.

Decommissioning

7.8.28 The environmental effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of one year.

7.8.29 Therefore, the likely significance of effects relating to the construction phase assessment will be applicable to the decommissioning phase.

Determination of significance

7.8.30 The determination of significance of an effect is undertaken with regard to the impact magnitude and sensitivity of the Receptor, using the standards and guidance detailed above, and using professional judgment. The general approach to the determination of significance is provided in **Chapter 4: Approach to the EIA (Volume 6.2)**.

7.8.31 **Table 7.21 Establishing the sensitivity of Receptors** details the basis for assessing Receptor sensitivity which has been produced on the basis of experience of assessing similar facilities and professional judgement.

Table 7.21 Establishing the sensitivity of Receptors

Sensitivity	Examples
High	Eye clinics, hospital operating theatres, recording studios
Medium	Dwellings, schools, hotels.
Low	Office buildings, public amenity areas.
Negligible	Industrial and commercial premises (inc. associated low density office spaces).

7.8.32 Receptors are assessed on days and times when they are expected to be in use. Potential impacts at schools are included in assessments of weekday daytime scenarios. Potential impacts at The Eye Clinic are assessed during weekday and Saturday daytimes. Residential and industrial/ commercial Receptors are included in assessments on all days and in all time periods.

7.8.33 The precise determination of impact magnitudes for construction and operational noise effects are based on relevant guidance and professional judgement. For example, whilst DMRB LA 111 provides criteria which may be directly transposed to different impact magnitude categories, the assessment methodology for assessing construction and operational site noise does not readily transpose in this way. This is due to the numerous factors that must be considered when determining the result of the assessment. For example, for construction noise, a significant effect may be indicated by an exceedance of the BS 5228-1 threshold, however the impacts would be acceptable if only occurring over a limited number of days and all practicable steps are taken to minimise construction noise. For operational noise, an adverse impact may be indicated by the BS 4142 initial estimate, but the results

of the initial estimate may be modified when taking into account the various contextual considerations.

7.8.34 **Table 7.22 Magnitudes of construction noise affecting dwellings** provides the outline criteria that will determine the impact magnitudes for construction noise, based on the ABC method of determining the significance of impact provided in Annex E Section E.3.2. of BS 5228-1:2009+A1:2014. Following the baseline surveys, ambient sound levels were found to be far below the lowest threshold categories in many cases. Therefore, whilst reference is made to the baseline sound levels in **Table 7.22 Magnitudes of construction noise affecting dwellings**, the criteria have been further described in accordance with the ABC method in BS 5228-1, the term 'baseline' in this case refers to the comparison of existing ambient levels and the thresholds of significance. The final outcome of the assessment of construction noise will also require consideration of absolute sound levels and the duration of specific activities.

Table 7.22 Magnitudes of construction noise affecting dwellings

Magnitude	Description
High	Levels very much greater than baseline and very disruptive (10 dB or more above threshold of significance).
Medium	Levels greater than baseline and disruptive (between 5 to 9 dB above threshold of significance).
Low	Levels approximately equal to baseline (less than 5 dB above threshold of significance).
Negligible	Levels less than baseline (lower than threshold of significance).

7.8.35 **Table 7.23 Magnitudes of construction and operational noise affecting non-residential Receptors** provides the criteria of the impact magnitudes for construction noise, based on the criteria contained within BS 8233 and BS 5228-1.

Table 7.23 Magnitudes of construction and operational noise affecting non-residential Receptors

Magnitude	Construction noise level, dBA	Description
High	>=65	Criteria based on guidance in BS 5228-1. Levels over 65 dBA are increasingly likely to give rise to an exceedance of a total ambient sound level of 75 dBA. BS 5228-1 provides an ambient noise limit, for assessing construction noise, of 75 dBA for offices in industrial areas affected by daytime construction noise.

Medium	50 – 64	Criteria based on guidance in BS 8233 – potential for increasing interference with external speech communication/use of office spaces when windows are partially open.
Low	45 – 49	Criteria based on guidance in BS 8233 – some potential to interfere with external speech communication/use of office spaces when windows are partially open.
Negligible	<=44	Criteria based on guidance in BS 8233 – unlikely to interfere with external speech communication/use of office spaces when windows are partially open.

7.8.36 **Table 7.24 Magnitudes of construction vibration affecting dwellings** below provides the criteria for the impact magnitudes for construction vibration at residential Receptors, based on the criteria contained within 5228-2:2009+A1:2019. For residential Receptors, impact magnitudes are defined based on the likely perception and subjective response to construction vibration.

Table 7.24 Magnitudes of construction vibration affecting dwellings

Magnitude	Vibration Level, mm/s	Description
High	>=10	Vibration is likely to be intolerable for any more than a brief exposure to this level in most building environments.
Medium	1 – 9.9	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
Low	0.3 – 0.9	Vibration might be just perceptible in residential environments.
Negligible	<0.3	Vibration unlikely to be perceptible in residential environments.

7.8.37 **Table 7.25 Magnitudes of construction vibration affecting industrial and commercial Receptors** below provides the criteria that determine the impact magnitudes for construction vibration at industrial and commercial Receptors, based on the criteria contained within 5228-2:2009+A1:2019. For industrial and commercial Receptors, impact magnitudes are based on potential building damage due to construction vibration.

Table 7.25 Magnitudes of construction vibration affecting industrial and commercial Receptors

Magnitude	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
High (Major damage)	Reinforced or framed structures Industrial and heavy commercial buildings.	Vibration levels greater than four times the criteria below for an impact of low magnitude.	
	Unreinforced or light framed structures. Residential or light commercial buildings.		
Medium (Minor damage)	Reinforced or framed structures Industrial and heavy commercial buildings.	Vibration levels greater than twice the criteria below for an impact of low magnitude.	
	Unreinforced or light framed structures. Residential or light commercial buildings.		
Low (Cosmetic damage)	Reinforced or framed structures Industrial and heavy commercial buildings.	50mm/s at 4 Hz and above.	50mm/s at 4Hz and above.
	Unreinforced or light framed structures. Residential or light commercial buildings.	15mm/s at 4 Hz increasing to 20mm/s at 15 Hz.	20mm/s at 15 Hz increasing to 50mm/s at 40Hz and above.
Negligible	Reinforced or framed structures Industrial and heavy commercial buildings.	Vibration levels below the criteria above for an impact of low magnitude.	
	Unreinforced or light framed structures. Residential or light commercial buildings.		

7.8.38 **Table 7.26 Magnitudes of increase in traffic noise at dwellings in the short-term** below provides the proposed impact magnitude categories for assessing construction traffic noise, and operational traffic noise in the opening year, based on the guidance contained within DMRB LA 111.

Table 7.26 Magnitudes of increase in traffic noise at dwellings in the short-term

Magnitude	Increase in BNL of closest public road used for construction traffic, dB
High	Greater than or equal to 5.0.
Medium	Greater than or equal to 3.0 and less than 5.0.
Low	Greater than or equal to 1.0 and less than 3.0.
Negligible	Less than 1.0.

7.8.39 **Table 7.27 Magnitudes of increase in traffic noise at dwellings in the long-term** below provides the proposed impact magnitude categories for assessing operational traffic noise in a future year, typically 15 years after the opening year, based on the guidance contained within DMRB LA 111.

Table 7.27 Magnitudes of increase in traffic noise at dwellings in the long-term

Magnitude	Increase in BNL of closest public road used for operational traffic, dB
High	Greater than or equal to 10.0.
Medium	Greater than or equal to 5.0 and less than or equal to 9.9.
Low	Greater than or equal to 3.0 and less than or equal to 4.9.
Negligible	Less than 3.0.

7.8.40 **Table 7.28 Magnitudes for operational site noise** below provides the impact magnitude categories for assessing operational site noise, based on the results of the initial estimate of impact undertaken in accordance with BS 4142:2014+A1:2019. The final determination of impact magnitude depends on consideration of the context, as required by the method detailed in the standard.

Table 7.28 Magnitudes for operational site noise

Magnitude	Initial Estimate of Impact
High	Rating levels significantly exceeding (+8 dB, or more, above) Receptor background sound levels.
Medium	Rating levels moderately exceeding (+3 to +7 dB above) Receptor background sound levels.
Low	Rating levels just exceeding (+1 to +2 dB above) Receptor background sound levels.
Negligible	Rating levels equal to, or lower than, background sound levels.

Magnitude	Initial Estimate of Impact

7.8.41 **Table 7.29 Significance evaluation matrix** below provides the assessment matrix which has been used to determine the significance of effects based on the sensitivity of the Receptor and the predicted impact magnitudes.

7.8.42 This differs slightly from the significance evaluation matrix provided in **Chapter 4: Approach to the EIA Table 4.1 (Volume 6.2)**, as it only includes four sensitivity categories and four 'impact magnitude' categories, rather than five 'magnitude of change' categories. Additionally, 'negligible' is used in place of 'very low', and 'potentially significant' is used in the diagonal from low Receptor sensitivity to low magnitude of impact as opposed to 'probably'.

7.8.43 The additional diagonal of 'potentially significant' reflects the complex nature of noise impact assessment, which often relies not only on the difference between the predicted specific sound level and the baseline sound level, but also on the absolute level of the specific sound, the total sound level when baseline and specific sound levels are combined, and other factors such as the time of day, the character of the sound, etc. This approach allows for appropriate application of professional judgement in cases where there are various factors to consider when determining the significance of effects.

7.8.44 Whilst noise impact assessment is multifaceted and often requires the application of professional judgement, the outcome of the assessment is rarely subject to such granularity that five different impact magnitude categories are necessary. This is reflected, for example, in the four impact magnitude categories for construction vibration provided in **Table 7.24 Magnitudes of construction vibration affecting dwellings** and **Table 7.25 Magnitudes of construction vibration affecting industrial and commercial Receptors**, which are based on criteria contained in the relevant British Standards, and the four impact magnitude categories for changes in traffic noise in **Table 7.26 Magnitudes of increase in traffic noise at dwellings in the short-term**, which reproduce the criteria contained in DMRB LA 111.

Table 7.29 Significance evaluation matrix

Receptor Sensitivity	Magnitude of change: High	Medium	Low	Negligible
High	Major (Significant)	Major (Significant)	Moderate or Major (Potentially significant)	Moderate (Potentially significant)
Medium	Major (Significant)	Moderate or Major (Potentially significant)	Moderate (Potentially significant)	Minor (Not significant)
Low	Moderate or Major (Potentially significant)	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)
Negligible	Moderate (Potentially significant)	Minor (Not significant)	Negligible (Not significant)	Negligible (Not significant)

7.8.45 Following determination of significance, the outcome of the assessment has been defined in terms of the effect levels detailed in, and the three aims of, the NPSE as set out in **Section 7.3**.

7.9 Environmental assessment of noise and vibration effects

Construction noise

7.9.1 A quantitative assessment of construction noise has been undertaken, based on information on the likely plant requirements, construction programme and representative baseline sound levels. The full assessment is presented in **Appendix 7B Construction Noise Assessment (Volume 6.2),** with the results summarised below.

Residential Receptors

7.9.2 With reference to **Table 7.21 Establishing the sensitivity of Receptors**, all residential Receptors are of medium sensitivity. With reference to the summary provided in **Appendix 7B Construction Noise Assessment, Table 3.2 Construction noise assessment, summary of results: residential Receptors (Volume 6.4)** potentially significant effects were identified at:

- Receptors 2 – 5 due to certain periods of the works occurring at, and in the vicinity of, the EfW CHP Facility Site;
- At Receptors 44 – 49 due to works on the Grid Connection; and
- Receptors 31 – 39 due to works at the northern end of the CHP Connection.

7.9.3 For all other works and assessment locations, predicted impacts are of no greater than Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, impacts of Negligible magnitude to Receptors of Medium sensitivity result in effects that are Minor, and are **Not Significant**.

7.9.4 Consideration of the duration of effects is essential to the final determination of significance. All potentially significant effects were examined in terms of the anticipated duration of the works, and the final determination of significance was carried out in accordance with **Table 7.29 Significance evaluation matrix**. A summary of effects confirmed as significant are provided below in **Table 7.30 Summary of significant effects due to construction noise at residential Receptors** of the activities, timings and locations where potentially significant effects were confirmed as significant and the resultant effect level in terms of the NPSE. Mitigation measures to reduce the significant effects identified are described in **Appendix 7B Construction Noise Assessment, Section 5 Mitigation (Volume 6.4)** and outlined in **Section 7.10**.

Table 7.30 Summary of significant effects due to construction noise at residential Receptors

Period	Construction activities for development components	Receptors where significant effects confirmed	Magnitude of impact	Significance of effect	NPSE Effect Level
Months 2 to 8	EfW CHP Facility and Access Improvements.	R2, R3	R2: High to medium R3: Medium	R2: Major to moderate or major R3: Moderate or major	SOAEL
Months 16 to 18	Grid Connection & Water Connection along New Bridge Lane, Water Connection – A47 crossing (HDD option) and M&E (out of core hours works).	R2, R3, R4, R5	R2: Medium R3: High R4: Medium R5: Low	R2: Moderate or major R3: Major R4: Major to moderate or major R5: Moderate	R2 – R4: SOAEL R5: LOAEL
Months 18 to 22	EfW CHP Facility Site roads and hardstandings, M&E and plant installation.	R2, R3	R2: Low R3: Low	R2: Moderate R3: Moderate	R2, R3: LOAEL
Month 25	EfW CHP Facility Site structures, M&E, plant installation and CHP Connection site clearance.	R3	Low	Moderate	LOAEL
Months 34 to 43	EfW CHP Facility commissioning and testing (out of core hours works).	R2	Low	Moderate	LOAEL

Non-residential Receptors

7.9.5 With reference to **Table 7.21 Establishing the sensitivity of Receptors**, all industrial and commercial Receptors are of Negligible sensitivity, the Cambian

Education Foundation Learning Centre (R27) is of Medium sensitivity during weekday daytimes and the Eye Clinic (25) is of High sensitivity during daytimes on weekdays and Saturdays. With reference to the summary provided in **Appendix 7B Construction Noise Assessment Table 4.2 Construction noise assessment, summary of results: non-residential Receptors**, potentially significant effects were identified at:

- Receptors 22, 23, 25 and 27 – due to daytime mobilisation activities at the TCC; and
- Receptors 16 – 27 due to various works at, and the vicinity of, the EfW CHP Facility Site, at various stages of the construction programme.

7.9.6 For all other works and assessment locations, predicted effects are of no greater than Medium magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Medium magnitude to Receptors of Negligible sensitivity result in effects of Minor, and are **Not Significant**.

7.9.7 Consideration of the duration of effects, and absolute sound levels, is essential to the final determination of significance. All potentially significant effects were examined in terms of the anticipated duration of the works, predicted construction noise levels and baseline sound levels, and the final determination of significance was carried out in accordance with **Table 7.29 Significance evaluation matrix**. A summary is provided below in **Table 7.31 Summary of significant effects due to construction noise at non-residential Receptors** of the activities, timings and locations where potentially significant effects were confirmed as significant and the resultant effect level in terms of the NPSE. Mitigation measures to reduce the significant effects identified are described in **Appendix 7B Construction Noise Assessment Section 5 Mitigation (Volume 6.4)** and outlined in **Section 7.10**.

Table 7.31 Summary of significant effects due to construction noise at non-residential Receptors

Period	Construction activities for development components	Receptors where significant effects confirmed	Magnitude of impact	Significance of effect	NPSE Effect Level
Month 1	Activities at the TCC.	R22, R23	High	Moderate	LOAEL
Months 2 to 8	EfW CHP Facility Site mobilisation, EfW CHP Facility Site earthworks, Access Improvements.	R16, R18, R22 – R24 inclusive	High	Moderate	LOAEL
Month 8	EfW CHP Facility Site earthworks.	R16, R22, R24	High	Moderate	LOAEL
Months 10 to 12	EfW CHP Facility Site foundations and plant installation.	R16, R22, R24	High	Moderate	LOAEL
Months 12 to 16	EfW CHP Facility Site foundations, plant installation and M&E.	R16, R22, R24	High	Moderate	LOAEL

Period	Construction activities for development components	Receptors where significant effects confirmed	Magnitude of impact	Significance of effect	NPSE Effect Level
Months 12 to 31	EfW CHP Facility Site: M&E (out of core hours works).	R16, R22, R24	High	Moderate	LOAEL
Months 16 to 18	EfW CHP Facility Site foundations, M&E, plant installation and Grid Connection.	R16, R22, R24	High	Moderate	LOAEL
Months 18 to 22	EfW CHP Facility Site: roads and hardstandings, structures, M&E and plant installation.	R16, R17, R22, R24	High	Moderate	LOAEL
Months 22 to 25	EfW CHP Facility Site structures, M&E and plant installation.	R16, R22, R24	High	Moderate	LOAEL
Month 25	EfW CHP Facility Site structures, M&E, plant installation and CHP Connection site clearance.	R16, R22, R24	High	Moderate	LOAEL
Months 26 to 30	EfW CHP Facility Site structures, M&E and plant installation and CHP Connection foundations.	R16, R22, R24	High	Moderate	LOAEL
Month 31	EfW CHP Facility Site structures, M&E and plant installation and CHP Connection pipeline installation.	R16, R22, R24	High	Moderate	LOAEL
Months 31 to 34	EfW CHP Facility Site structures and plant installation.	R16, R22, R24	High	Moderate	LOAEL
Months 34 to 36	EfW CHP Facility Site structures, commissioning and testing.	R16, R22, R24	High	Moderate	LOAEL
Months 36 to 43	EfW CHP Facility commissioning and testing	R16	High	Moderate	LOAEL

Construction vibration

7.9.8 A qualitative assessment of construction vibration has been undertaken, based on information on the likely use of vibratory rollers during works on the Access Improvements. Potential construction vibration impacts would occur over a short-term duration and would be controlled, if necessary, through management of potential impacts.

7.9.9 The use of vibratory rollers will be required for the Access Improvements, and hence will be in close proximity to a number of existing residential and non-residential buildings located along New Bridge Lane (primarily R2, R3, R17 and R18).

7.9.10 It is considered that the level of vibration emitted by the use of vibratory rollers could give rise to levels of vibration in dwellings within 20 m of the works which could be perceived, and which could give rise to minor cosmetic damage. Receptors R2 and R3 are within 20 m of the Access Improvements works which will entail use of vibratory rollers. Though, at this stage, there are no plans to resurface the stretch of New Bridge Lane in proximity to R1, if this becomes a requirement then R1 would also be within 20 m of vibratory rollers. The dwelling at R3 is approximately 20 m from the Access Improvements, but there is a drainage ditch between R3 and New Bridge Lane which serves to provide a horizontal disconnect in the propagation path that will serve to reduce the propagation of vibration from vibratory rollers.

7.9.11 Residential Receptors are of Medium sensitivity to noise (including vibration) effects. With reference to **Table 7.24 Magnitudes of construction vibration affecting dwellings** it is considered that impacts to R2 from vibration from vibratory rollers would tend to be of Medium magnitude, but could be of High magnitude for brief moments when vibratory rollers are in closest proximity. At R3 it is considered that effects would be of Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Medium to High magnitude to Receptors of Medium sensitivity result in effects of Moderate or Major significance, which are potentially significant, to effects of Major significance. Impacts of Low magnitude to Receptors of Medium sensitivity result in effects of Moderate significance and are potentially significant. With regard to R2 it is considered, based on the likely duration of the Moderate or Major effects, that these effects would tend towards Moderate significance and are **Not Significant**, but that Major effects are **Significant**. With regard to R3 it is considered unlikely that any building damage would occur, any moderate effects would be of short duration, and that the Moderate effects are therefore **Not Significant**.

7.9.12 It is considered most unlikely that the level of vibration emitted by the use of vibratory rollers would cause any cosmetic or structural damage at the industrial and/ or commercial buildings at R17 and R18. Industrial and commercial Receptors are of Negligible sensitivity to noise (including vibration) effects. With reference to **Table 7.25 Magnitudes of construction vibration affecting industrial and commercial Receptors** it is considered that effects upon industrial and commercial Receptors would be of no greater Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Negligible magnitude to Receptors of Negligible sensitivity result in effects of Negligible significance and are **Not Significant**.

7.9.13 Additional mitigation measures to reduce the significant effects identified above are outlined in **Section 7.10**, and are detailed in the **Outline CEMP (Volume 7.12)**. Construction works will be required to be undertaken in accordance with a final CEMP, consistent with the **Outline CEMP (Volume 7.12)**, as secured through a DCO Requirement.

Construction traffic noise

7.9.14 Initial predictions of the increase in BNL are presented below for the month 14 construction period. Only those road links within the Study Area where a significant proportion of construction traffic will be routed are considered, and only those links where a noise increase 1 dB above are assessed, as set out in paragraph 7.6.23. The scenario and construction period considered are as follows:

- EfW CHP Facility Construction Traffic only - Month 14 (Weeks 58-61) - All Traffic out of the Site via New Bridge Lane. Predicted increases in BNL presented in **Table 7.32 Predicted construction phase increase in traffic noise.**

Table 7.32 Predicted construction phase increase in traffic noise

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2024 baseline + construction traffic)	% HGV (2024 baseline + construction traffic)	Predicted Traffic Noise Increase, dB
Algores Way	2804	6.8	3421	7.7	1.1
New Bridge Lane (until Salters Way)	705	22.2	856	34.1	2.0

7.9.15 The results in **Table 7.32 Predicted construction phase increase in traffic noise** indicate that the greatest predicted increases in traffic noise are 1.1 dB and 2 dB, on Algores Way and New Bridge Lane, respectively. All other predicted increases are below 1 dB.

7.9.16 It is noted that the predictions for New Bridge Lane possess some inherent uncertainties as the road is low-flow as defined in CRTN (i.e. with two-way traffic flows below 1000 vehicles). However, this uncertainty has a negligible influence on the assessment, as the dominant source of road traffic noise at R2 is traffic on Cromwell Road, as discussed in **Section 7.8** under the heading **'Traffic Noise (construction and operation)'**.

7.9.17 With reference to the short-term criteria contained in **Table 7.26 Magnitudes of increase in traffic noise at dwellings**, the results are indicative of an effect of Low magnitude to Receptors on Algores Way and New Bridge Lane. Results at all other Receptors are indicative of effects of Negligible magnitude and are **Not Significant**.

7.9.18 Receptors on New Bridge Lane consist of residential Receptors, which are of Medium sensitivity to noise effects, and industrial and commercial Receptors, which are of Negligible sensitivity to noise effects.

7.9.19 Receptors on Algores Way consist of industrial and commercial Receptors, which are of Negligible sensitivity to noise effects, educational Receptors at Cambian School and TBAP Unity Academy, which are of Medium sensitivity, and residential Receptors near 64 and 66 Weasenham Lane, which are of Medium sensitivity to noise effects.

7.9.20 With reference to **Table 7.29 Significance evaluation matrix**, and with regard to residential Receptors on New Bridge Lane and Weasenham Lane, effects of Low magnitude to Receptors of Medium sensitivity result in effects of Moderate

significance, and are potentially Significant. On the basis that the exceedance of the predicted increase above the threshold for a low impact is small, and potential effects would be short-term only, it is considered that the potentially significant effects identified are **Not Significant**. In terms of the NPSE, it is considered that effects to residential Receptors are at the NOEL.

7.9.21 With reference to **Table 7.29 Significance evaluation matrix**, and in consideration of industrial and commercial Receptors, effects of Low magnitude to Receptors of Negligible sensitivity result in effects of Negligible significance, and are **Not Significant**. In terms of the NPSE, it is considered that effects upon industrial and commercial Receptors are at the NOEL.

7.9.22 With reference to **Table 7.29 Significance evaluation matrix**, and in consideration of the educational Receptors, effects of Low magnitude to Receptors of Medium sensitivity result in effects of moderate significance and are potentially significant. As the exceedance above the threshold for a Low effect is small, and effects would be temporary, and as the increase in road traffic noise level would be most unlikely to cause any effects at the schools, or interfere with their normal operation, it is considered that the potentially significant effects identified are **Not Significant**. In terms of the NPSE, it is considered that effects to schools are at the NOEL.

Construction traffic vibration

7.9.23 A qualitative assessment of likely significant effects due to vehicle induced vibration during the construction phase has been undertaken, as set out under paragraph 7.8.24.

7.9.24 Potential effects due to vehicle induced vibration would be limited to Receptors on New Bridge Lane where an increase in HGV movements is anticipated during the construction phase. On all other road links there are more significant baseline flows of HGVs and, as such, the additional HGV movements during the construction phase would be unlikely to give rise to any significant increase in levels of vehicle induced vibration.

7.9.25 Transport data indicates that, in the construction year (2024), baseline flows include 167 HGV movements on New Bridge Lane between Cromwell Road and Salters Way. It is assumed that there are negligible or no HGV movements on New Bridge Lane east of Salters Way, except for occasional HGVs accessing the builders yard north of 9 New Bridge Lane (R2).

7.9.26 Transport data indicates that, during the construction phase, HGV movements on New Bridge Lane between Cromwell Road and the proposed Site access from New Bridge Lane will increase to around 292 HGV movements per day.

7.9.27 Potential for adverse effects at industrial and commercial Receptors is considered to be Negligible due to their modern construction, and the sensitivity of industrial and commercial uses to vibration effects. With reference to **Table 7.21 Establishing the sensitivity of Receptors**, industrial and commercial Receptors (R17, R19) are of Negligible sensitivity to noise (including vibration) effects. It is considered that effects to industrial and commercial Receptors would be of no greater than Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of low magnitude to Receptors of Negligible sensitivity result in effects of Negligible

significance and are **Not Significant**. In terms of the NPSE it is considered that these effects are equivalent to the NOEL.

7.9.28 Potential for adverse effects at residential Receptors is considered to be proportional to the proximity to the carriageway edge and the magnitude of the change in HGV movements anticipated during the construction and operational phases.

7.9.29 The dwelling at R1 is approximately 10m from the carriageway edge and would be subject to an approximate doubling of HGV movements on New Bridge Lane during the construction phase. On the basis that HGV movements would approximately double, it is considered that effects due to vehicle induced vibration at R1 would tend to be of Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Negligible magnitude to Receptors of Medium sensitivity result in effects that are Minor and are **Not Significant**. In terms of the NPSE it is considered that these effects are equivalent to the NOEL. Notwithstanding the "not significant" determination, it is recommended that a condition survey is carried out on the dwelling, such that if deterioration of the dwelling's condition is reported, there is a pre-development baseline to compare against. This is outlined in **Section 7.10**.

7.9.30 The dwelling at R2 is approximately 5m from the carriageway edge and currently experiences minimal or no passing HGVs, except for occasional HGV movements associated with the builders yard to the north. It is therefore considered that effects due to vehicle induced vibration at R2 would tend to be of Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Low magnitude to Receptors of Medium sensitivity result in effects of moderate significance and are potentially significant. Using professional judgement, and in consideration that the number of HGV movements by R2 would be increasing from approximately zero to around 292 per day, it is considered that the potentially significant effects identified above would be **Significant**. In terms of the NPSE it is considered that these effects are equivalent to the LOAEL. Mitigation measures required to reduce and avoid the effects are detailed in **Section 7.10**.

7.9.31 The dwelling at R3 is approximately 20m from the carriageway edge, but there is a drainage ditch between R3 and New Bridge Lane which serves to provide a horizontal disconnect in the propagation path that will serve to reduce the propagation of vehicle induced vibration from vehicle movements on New Bridge Lane. It is therefore considered that effects due to vehicle induced vibration at R3 would tend to be of Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, impacts of Negligible magnitude to Receptors of Medium sensitivity result in effects that are Minor and are **Not Significant**. In terms of the NPSE it is considered that these effects are equivalent to the NOEL.

Operational traffic noise

7.9.32 Initial predictions of the increase in BNL are presented below for operational traffic. Only those road links within the study where a significant proportion of operational traffic will be routed are considered and of these, only increases in excess of 1dB are presented. The operational traffic flows include HGVs accessing the EfW CHP Facility Site via New Bridge Lane and staff cars and vans accessing the EfW CHP

Facility Site via Algores Way. Predicted increases in BNL are presented in **Table 7.33 Predicted operational increase in traffic noise.**

7.9.33 Increases in road traffic noise at 9 and 10 New Bridge Lane due to vehicles accessing the EfW CHP Facility Site are not assessed using this method but are included within the operational noise assessment. This approach is taken because of uncertainty inherent in predicting noise from road links with a low flow, discussed in **Section 7.8** under the heading **'Traffic Noise (construction and operation)'**, and because it provides a robust and worst-case approach.

Table 7.33 Predicted operational increase in traffic noise

Road	18-hour traffic flow (2021 baseline)	% HGV (2021 baseline)	18-hour traffic flow (2027 baseline + development traffic)	% HGV (2027 baseline + development traffic)	Predicted Traffic Noise Increase, dB
New Bridge Lane	705	22.2	1038	44.0	3.6

7.9.34 The results in **Table 7.33 Predicted operational increase in traffic noise** indicate that the increase in traffic noise level is 3.6 dB at New Bridge Lane. With reference to the short-term criteria contained in **Table 7.26 Magnitudes of increase in traffic noise at dwellings in the short-term**, the results are indicative of an effect of Medium magnitude for Receptors on New Bridge Lane. Though it should be recognised that the CRTN methodology is not reliable for low-flow roads particularly where there is such a high percentage of HGVs, and that traffic noise from Cromwell Road will be dominant at 2 New Bridge Lane (R1). Therefore, the predicted increases on New Bridge Lane are unlikely to change the overall ambient noise levels at 2 New Bridge Lane, as road traffic noise from Cromwell Road will be dominant at this location.

7.9.35 Receptors on New Bridge Lane consist of one residential Receptor, R1, which is of Medium sensitivity to noise effects, and industrial and commercial Receptors, which are of Negligible sensitivity to noise effects (9 and 10 New Bridge Lane are considered within the operational noise assessment).

7.9.36 With reference to **Table 7.29 Significance evaluation matrix**, effects of Medium magnitude to Receptors of Medium sensitivity result in effects of moderate or major significance, and are potentially significant. Impacts of Medium magnitude to Receptors of Negligible sensitivity result in effects that are Minor and are **Not Significant**.

7.9.37 It is considered that operational development traffic will tend to remain at a similar flow throughout the operation of the EfW CHP Facility, whilst other traffic flows in the local area will generally tend to increase. As such, if the prediction results provided in **Table 7.33 Predicted operational increase in traffic noise** are considered representative of a worst-case long-term traffic increase and are compared with the long-term criteria provided in **Table 7.27 Magnitudes of increase in traffic noise at dwellings in the long-term,** the magnitude for the dwelling on New Bridge Lane would be Low and resultant effects would be Minor and **Not Significant**.

7.9.38 The only residential Receptor covered by this CRTN assessment is R1. Although the increase on New Bridge Lane indicates a potentially significant effect in the short-term, given the Receptor's proximity to Cromwell Road, the operational traffic is not expected to result in a significant change to the total ambient noise levels that R1 is exposed to.

7.9.39 It is therefore considered, based on the above, that the potentially significant effects are **Not Significant**, as operational traffic noise would likely not be noticeable in the short-term, due to the influence of road traffic noise from vehicles on Cromwell

Road, and would likely result in effects of minor significance in the long-term. In terms of the NPSE, it is considered that, in the short-term, effects to residential Receptors are at the LOAEL, and in the long-term, effects to residential Receptors are at the NOEL. It is considered that effects to industrial and commercial Receptors are at the NOEL.

Operational traffic vibration

7.9.40 A qualitative assessment of likely significant effects due to vehicle induced vibration during the operational phase has been undertaken, as set out under paragraph 7.8.24.

7.9.41 Potential effects due to vehicle induced vibration would be limited to Receptors on New Bridge Lane where a substantial increase in HGV movements is anticipated during the operational phase. On all other road links there are more significant baseline flows of HGVs and, as such, the additional HGV movements during the operational phase would be unlikely to give rise to any significant increase in levels of vehicle induced vibration.

7.9.42 Transport data indicates that, in the first year of full operation (2027), baseline flows include 173 HGV movements on New Bridge Lane between Cromwell Road and Salters Way. It is assumed that, without the development, there are negligible or no HGV movements on New Bridge Lane east of Salters Way, except for occasional HGVs accessing the builders yard north of 9 New Bridge Lane.

7.9.43 Transport data indicates that, during the operational phase, HGV movements on New Bridge Lane between Cromwell Road and the proposed EfW CHP Facility Site's access will increase to around 457 HGVs per day.

7.9.44 Potential for adverse effects at industrial and commercial Receptors is considered to be Negligible due to modern construction, and the sensitivity of industrial and commercial uses to vibration effects. With reference to **Table 7.21 Establishing the sensitivity of Receptors**, industrial and commercial Receptors (R17, R19) are of Negligible sensitivity to noise (including vibration) effects. It is considered that effects to industrial and commercial Receptors would be of no greater than Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of low magnitude to Receptors of Negligible sensitivity result in effects which are Negligible and are **Not Significant**. In terms of the NPSE it is considered that these effects are equivalent to the NOEL.

7.9.45 Potential for adverse effects at residential Receptors is considered to be proportional to the proximity to the carriageway edge and the magnitude of the change in HGV movements anticipated during the construction and operational phases.

7.9.46 The dwelling at R1 is approximately 10m from the carriageway edge would be in close proximity to around 173 HGV movements per day, on average, without the Proposed Development. The operational phase entails an anticipated total number of HGV movements per day on New Bridge Lane of around 457. Based on the above it is considered that effects due to vehicle induced vibration at R1 would tend to be of Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Negligible magnitude to Receptors of Medium sensitivity result in

effects which are Minor and are **Not Significant**. In terms of the NPSE it is considered that these effects are equivalent to the NOEL. Notwithstanding the "not significant" determination, it is recommended that a condition survey is carried out on the dwelling, such that if deterioration of the dwelling's condition is reported, there is a pre-development baseline to compare against. This is outlined in **Section 7.10**.

7.9.47 The dwelling at R2 is approximately 5m from the carriageway edge and currently experiences minimal or no passing HGVs, except for occasional HGV movements associated with the builders yard to the north. It is therefore considered that effects due to vehicle induced vibration at R2 would tend to be of Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, effects of Low magnitude to Receptors of Medium sensitivity result in effects of Moderate significance and are potentially significant. Using professional judgement, and in consideration that the number of HGV movements by R2 would be increasing from approximately zero to around 456 per day, it is considered that the potentially significant effects identified above would be **Significant**. In terms of the NPSE it is considered that these effects are equivalent to the LOAEL. Mitigation measures required to reduce and avoid the effects are detailed in **Section 7.10**.

7.9.48 The dwelling at R3 is approximately 20 m from the carriageway edge, but there is a drainage ditch between R3 and New Bridge Lane which serves to provide a horizontal disconnect in the propagation path that will serve to reduce the propagation of vehicle induced vibration from vehicle movements on New Bridge Lane. It is therefore considered that effects due to vehicle induced vibration at R3 would tend to be of Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, impacts of Negligible magnitude to Receptors of Medium sensitivity result in effects which are Minor and are **Not Significant**. In terms of the NPSE it is considered that these effects are equivalent to the NOEL.

Operational noise

Residential Receptors

7.9.49 Predictions of operational noise levels at the nearest residential Receptors have been undertaken, accounting for fixed plant and vehicle movement (including the section of public highway, New Bridge Lane, between Salters Way and the EfW CHP Facility Site access, where vehicle flows will consist solely of waste delivery vehicles, and other HGVs delivering urea, lime and AC and exporting APCr and IBA).

7.9.50 Predicted operational sound levels at all Receptor locations are presented in **Appendix 7C Operational Noise Assessment Data (Volume 6.4)**. Noise Contours showing predicted specific sound levels due to the EfW CHP Facility are shown in **Figure 7.14 Noise model results: EfW CHP Facility, predicted daytime noise contours** and **Figure 7.15 Noise model results: EfW CHP Facility, predicted night-time noise contours (**both **Volume 6.3).**

7.9.51 Detailed prediction results summed across all Receptor locations indicates that, during daytimes and evenings, sound from HGV movements are predicted to be dominant. The next most dominant sources are listed below in rank order, with the most dominant items listed first:

- Air cooled condenser;
- Boiler house building;
- Tipping hall (daytime, below chimney outlets level in evening & night-time);
- Induced draft fans buildings;
- Bag filter houses;
- Water treatment plant;
- Water recooling system; and
- Chimney outlets.

7.9.52 The specific sound from the operation of the EfW CHP Facility consists of sound from fixed plant and from vehicle movements. Fixed plant will be designed such that sound emitted will be broadband in nature, with no tonal components. There is therefore no requirement to apply any rating penalties for tonal characteristics. The facility will operate continuously and will not feature any impulsive components. There is therefore no requirement to apply any rating penalties for intermittency or impulsivity. In general, at the nearest Receptors, the residual sound is dominated by existing industrial and commercial sources and by road traffic noise. Therefore, the character of the specific sound is identical in nature to the residual sound. As such, rating penalties are only applied for 'other sound characteristics' at 9 and 10 New Bridge Lane, where the predicted specific sound level exceeds the residual sound level, indicating that the specific sound could be readily distinguishable in the residual acoustic environment.

Initial estimate of impact

7.9.53 Predicted operational noise levels have been compared with the representative baseline sound levels for those Receptors closest to the EfW CHP Facility in the BS 4142:2014+A1:2019 initial estimate of impact. All Receptors considered are residential and of medium sensitivity. **Table 7.34 BS 4142:2014 Assessment: initial estimate of impact: weekdays** and **Table 7.35 BS 4142:2014 Assessment: initial estimate of impact: weekends** show the results of the BS 4142:2014 initial estimate of impacts for the weekday and weekend periods, respectively.

Table 7.34 BS 4142:2014 Assessment: initial estimate of impact: weekdays

Location	Background Sound Level, dB $L_{A90,T}$	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Rating Penalty, dB	Rating Level, dB $L_{Ar,Tr}$	Rating Level minus Background, dB
Day						
R1	44	54	43	0	43	-1
R2	49	54	63	+3	66	+17
R3	49	54	59	+3	62	+13
R4	54	62	46	0	46	-8
R5	54	62	40	0	40	-14
R6	54	62	41	0	41	-13

Location	Background Sound Level, dB $L_{A90,T}$	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Rating Penalty, dB	Rating Level, dB $L_{Ar,Tr}$	Rating Level minus Background, dB
R7	53	56	44	0	44	-9
R8	46	48	39	0	39	-7
R9	44	54	37	0	37	-7
R10	44	54	37	0	37	-7
Evening						
R1	44	50	38	0	38	-6
R2	46	50	51	0	51	+5
R3	46	50	49	0	49	+3
R4	42	58	41	0	41	-1
R5	42	58	38	0	38	-4
R6	42	58	35	0	35	-7
R7	52	55	42	0	42	-10
R8	45	48	37	0	37	-8
R9	44	50	31	0	31	-13
R10	44	50	33	0	33	-11
Night						
R1	43	48	37	0	37	-6
R2	43	51	47	0	47	+4
R3	43	51	46	0	46	+3
R4	39	55	41	0	41	+2
R5	39	55	38	0	38	-1
R6	39	55	35	0	35	-4
R7	52	54	42	0	42	-10
R8	45	46	36	0	36	-9
R9	43	48	30	0	30	-13
R10	43	48	32	0	32	-11

7.9.54 With reference to the impact magnitude criteria provided in **Table 7.28 Magnitudes for operational site noise** and **Table 7.34 BS 4142:2014 Assessment: initial estimate of impact: weekdays**, the results of the initial estimate indicate that, during weekdays, impacts of High magnitude could occur at R2 and R3 (9 and 10 New Bridge Lane) during the daytime, impacts of medium magnitude could occur at R2 and R3 during the evening, impacts of Medium magnitude could occur at R2 and R3 during the night time and an impact of Low magnitude could occur at R4 during the night-time. Impacts of Negligible magnitude are indicated at all other Receptors and times of day.

7.9.55 With reference to **Table 7.29 Significance evaluation matrix**, the results of the initial estimate of impact during weekdays indicates that major effects could occur at R2 and R3 during the daytime, Moderate or Major effects could occur at R2 and R3 during the evening, Moderate or Major effects could occur at R2 and R3 during

the night-time and Moderate effects could occur at R4 during the night-time. For all other Receptors and times of day during weekdays, indicative effects are Minor and are Not Significant. All moderate or major effects indicated above are potentially significant and all major effects indicated above are significant, and are considered further under the heading **'Operational noise – consideration of context - weekdays'** below.

Table 7.35 BS 4142:2014 Assessment: initial estimate of impact: weekends

Location	Background Sound Level, dB $L_{A90,T}$	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Rating Penalty, dB	Rating Level, dB $L_{Ar,Tr}$	Rating Level minus Background, dB
Day						
R1	40	50	40	0	40	0
R2	48	52	57	+3	60	+12
R3	48	52	53	+3	56	+8
R4	51	59	42	0	42	-9
R5	51	59	38	0	38	-13
R6	51	59	37	0	37	-14
R7	50	53	44	0	44	-6
R8	43	45	38	0	38	-5
R9	40	50	33	0	33	-7
R10	40	50	34	0	34	-6
Evening						
R1	38	46	37	0	37	-1
R2	45	48	47	0	47	+2
R3	45	48	46	0	46	+1
R4	43	55	41	0	41	-2
R5	43	55	38	0	38	-5
R6	43	55	35	0	35	-8
R7	52	52	42	0	42	-10
R8	45	45	36	0	36	-9
R9	38	46	31	0	31	-7
R10	38	46	32	0	32	-6
Night						
R1	35	42	37	0	37	+2
R2	45	50	47	0	47	+2
R3	45	50	46	0	46	+1
R4	40	52	41	0	41	+1
R5	40	52	38	0	38	-2
R6	40	52	35	0	35	-5
R7	52	51	42	0	42	-10
R8	45	43	36	0	36	-9
R9	35	42	30	0	30	-5

Location	Background Sound Level, dB $L_{A90,T}$	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Rating Penalty, dB	Rating Level, dB $L_{Ar,Tr}$	Rating Level minus Background, dB
R10	35	42	32	0	32	-3

7.9.56 With reference to the magnitude criteria provided in **Table 7.28 Magnitudes for operational site noise** and **Table 7.35 BS 4142:2014 Assessment: initial estimate of impact: weekends,** the results of the initial estimate during weekends indicates that effects of High magnitude could occur at R2 and R3 during the daytime, effects of Low magnitude could occur at R2 and R3 during the evening and effects of Low magnitude could occur at R1, R2, R3 and R4 during the night time. Effects of Negligible magnitude are indicated at all other Receptors and times of day.

7.9.57 With reference to **Table 7.29 Significance evaluation matrix**, the results of the initial estimate during weekends indicates that Major effects could occur at R2 and R3 during the daytime, Moderate effects could occur at R2 and R3 during the evening and Moderate effects could occur at R1, R2, R3 and R4 during the night-time. For all other Receptors and times of day during weekends, indicative effects are Minor and are not significant. All Moderate effects indicated above are potentially significant and all Major effects indicated above are significant, and are considered further under the heading **'Operational noise – consideration of context - weekends'** below.

Operational noise - consideration of context - weekdays

7.9.58 To contextualise the moderate and major effects indicated by the initial assessment of impact during weekdays, predicted increases of ambient sound levels at each Receptor have been calculated. These are shown below in **Table 7.36 Noise Change Calculation: Weekdays**.

Table 7.36 Noise Change Calculation: Weekdays

Location	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Ambient Sound Level, dB	Noise Change, dB
Day				
R1	54	43	54	0
R2	54	63	63	+9
R3	54	59	60	+6
R4	62	46	62	0
R5	62	40	62	0
R6	62	41	62	0
R7	56	44	56	0
R8	48	39	49	+1
R9	54	37	54	0
R10	54	37	54	0

Location	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Ambient Sound Level, dB	Noise Change, dB
Evening				
R1	50	38	50	0
R2	50	51	53	+3
R3	50	49	52	+2
R4	58	41	58	0
R5	58	38	58	0
R6	58	35	58	0
R7	55	42	56	+1
R8	48	37	48	0
R9	50	31	50	0
R10	50	33	50	0
Night				
R1	48	37	48	0
R2	51	47	52	+1
R3	51	46	52	+1
R4	55	41	55	0
R5	55	38	55	0
R6	55	35	55	0
R7	54	42	54	0
R8	46	36	47	+1
R9	48	30	48	0
R10	48	32	48	0

7.9.59 With reference to the predicted ambient noise changes during weekdays presented above in **Table 7.36 Noise Change Calculation: Weekdays** the majority of locations are not predicted to experience any notable increase in ambient sound levels.

7.9.60 With reference to **Table 7.20 Magnitude of ambient noise changes**, the outcomes of the noise change assessment, in terms of increases in total ambient sound levels, are listed below:

- Ambient noise increases at and above 6 dB at R2 and R3 during daytimes indicate an impact of High magnitude. With reference to **Table 7.29 Significance evaluation matrix,** impacts of High magnitude to Receptors of Medium sensitivity result in effects which are Major and are **Significant**;
- Ambient noise increase of 3 dB at R2 during evenings indicates an impact of Medium magnitude. With reference to **Table 7.29 Significance evaluation matrix**, impacts of Medium magnitude to Receptors of Medium sensitivity result in effects of Moderate or Major significance and are potentially significant. On the basis that the noise increase would be just perceptible it is considered that the effects would be Moderate and **Not Significant**;

- Ambient noise increases of 1 to 2 dB at R8 during daytimes, R3 and R7 during evenings and at R2, R3 and R8 during night-times indicate an impact of Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, a Low magnitude to Receptors of Medium sensitivity result in effects which are Moderate and potentially significant. On the basis that these increases would tend to be imperceptible, it is considered that the effects would be **Not Significant**; and
- Ambient noise increases of 0 dB at all other Receptors indicate an impact of Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, Negligible magnitude to Receptors of Medium sensitivity result in effects which are Minor and are **Not Significant**.

7.9.61 In consideration of the absolute sound levels where the noise change assessment indicates impacts of Low and Medium magnitude, it is considered that absolute levels of ambient sound would be unlikely to give rise to any adverse effects. Where the noise change assessment indicates High impacts, it is considered that absolute ambient sound levels would be likely to give rise to adverse effects.

Operational noise – determination of significance - weekdays

7.9.62 Based on the above, it is considered that the result of the BS 4142 assessment for weekdays are as follows. Major effects indicated in the initial estimate during daytimes at R2 and R3 are confirmed, and are **Significant**. The Moderate or Major effects indicated by the initial estimate at R2 and R3 during evenings and night-times are Moderate and are **Not Significant**. The Moderate effects indicated by the initial estimate during night-times at R4 are **Not Significant**.

Operational noise - consideration of context - weekends

7.9.63 To contextualise the Moderate and Major effects indicated by the initial assessment of impact during weekends, predicted increases of ambient sound levels at each Receptor have been calculated. These are shown below in **Table 7.37 Noise Change Calculation: Weekends**.

Table 7.37 Noise Change Calculation: Weekends

Location	Residual Sound Level, dB $L_{Aeq,T}$	Specific Sound Level, dB L_S	Ambient Sound Level, dB	Noise Change, dB
Day				
R1	50	40	50	0
R2	52	57	58	+6
R3	52	53	55	+3
R4	59	42	59	0
R5	59	38	59	0
R6	59	37	59	0
R7	53	44	54	+1
R8	45	38	46	+1
R9	50	33	50	0
R10	50	34	50	0
Evening				
R1	46	37	47	+1
R2	48	47	50	+2
R3	48	46	50	+2
R4	55	41	55	0
R5	55	38	55	0
R6	55	35	55	0
R7	52	42	53	+1
R8	45	36	45	0
R9	46	31	46	0
R10	46	32	46	0
Night				
R1	42	37	43	+1
R2	50	47	52	+2
R3	50	46	51	+1
R4	52	41	52	0
R5	52	38	52	0
R6	52	35	52	0
R7	51	42	52	+1
R8	43	36	44	+1
R9	42	30	42	0
R10	42	32	42	0

7.9.64 With reference to the predicted ambient noise changes during weekdays presented above in **Table 7.37 Noise Change Calculation: Weekends** the majority of locations are not predicted to experience any notable increase in ambient sound levels.

7.9.65 With reference to **Table 7.20 Magnitude of ambient noise changes**, the outcomes of the noise change assessment, in terms of increases in total ambient sound levels, are listed below:

- Ambient noise increase of 6 dB at R2 during daytimes indicates an impact of High magnitude. With reference to **Table 7.29 Significance evaluation matrix,** a High magnitude to Receptors of Medium sensitivity result in effects which are Major and are **Significant**;
- Ambient noise increase of 3 dB at R3 during daytimes indicates an impact of Medium magnitude. With reference to **Table 7.29 Significance evaluation matrix**, Medium magnitude to Receptors of Medium sensitivity result in effects which are Moderate or Major and are potentially significant. On the basis that the noise increase would be just perceptible it is considered that the effects would be Moderate and **Not Significant**;
- Ambient noise increases of 1 to 2 dB at R8 during daytimes, R1, R2, R3 and R7 during daytimes, evenings and night-times indicate an impact of Low magnitude. With reference to **Table 7.29 Significance evaluation matrix**, a Low magnitude to Receptors of Medium sensitivity result in effects of Moderate significance and are potentially significant. On the basis that these increases would tend to be imperceptible, it is considered that the effects would be **Not Significant**; and
- Ambient noise increases of 0 dB at all other Receptors indicate an impact of Negligible magnitude. With reference to **Table 7.29 Significance evaluation matrix**, a Negligible magnitude to Receptors of Medium sensitivity result in effects which are Minor and are **Not Significant**.

7.9.66 In consideration of the absolute sound levels where the noise change assessment indicates Low and Medium impacts, it is considered that absolute levels of ambient sound would be unlikely to give rise to any adverse effects. Where the noise change assessment indicates high impacts, it is considered that absolute ambient sound levels would be likely to give rise to adverse effects.

Operational noise – determination of significance - weekends

7.9.67 Based on the above, it is considered that the result of the BS 4142 assessment for weekends are as follows. Major effects indicated in the initial estimate during daytimes at R2 are confirmed, and are **Significant**. The Major effects indicated in the initial estimate at R3 during the daytime are unlikely, as consideration of context indicates that effects at R3 during the daytime would likely be not significant. As such, the result of the initial estimate at R3 during the daytime is modified to Moderate and effects that are potentially significant. As outlined above, consideration of the context indicates that effects at R3 during the daytime would be not significant, therefore the potentially significant effects at R3 during the daytime are **Not Significant**. The Moderate effects indicated by the initial estimate at R2 and R3 during evenings are **Not Significant**. The Moderate effects indicated by the initial estimate during night-times at R1, R2, R3 and R4 are **Not Significant**.

Summary

7.9.68 Following the results of the initial estimates, consideration of context indicated that it was necessary to modify the result of the initial estimate at R3 during weekend daytimes. Consideration of noise change and absolute sound levels indicated that, where Moderate effects were identified, which are potentially significant, effects would be **Not Significant**. Based on the above, the results of the BS 4142 assessment are summarised below:

- Major effects indicated on weekday daytimes at R2 and R3 are confirmed, and are **Significant**;
- Moderate or Major effects indicated at R2 and R3 on weekday evenings and night-times are moderate and are **Not Significant**;
- Moderate effects indicated at R4 during weekday night-times are **Not Significant**;
- Major effects indicated on weekend daytimes at R2 are confirmed and are **Significant**;
- Major effects indicated on weekend daytimes at R3 are unlikely, the result of the initial estimate was therefore modified to Moderate effects, which are potentially significant. Consideration of context indicated that the Moderate effects are **Not Significant**;
- Potentially significant Moderate effects indicated at R2 and R3 during weekend evenings are **Not Significant**;
- Potentially significant Moderate effects indicated at R1, R2, R3 and R4 during weekend night-times are **Not Significant**; and
- At all other Receptors and times of day, effects are of Minor significance and are **Not Significant**.

7.9.69 In summary, the results of the BS 4142:2014+A1:2019 assessment are that significant effects are confirmed at R2 during weekday and weekend daytimes, and at R3 during weekend daytimes. In terms of the NPSE, it is considered that worst-case impacts to R2 and R3 are at the SOAEL and worst-case impacts at all other Receptors are at the NOEL.

7.9.70 Mitigation measures required to reduce and avoid the significant effects identified are detailed in **Section 7.10**.

Non-residential Receptors

7.9.71 Predictions of operational noise levels at the nearest non-residential Receptors have been undertaken, accounting for fixed plant and vehicle movements (including the section of public highway, New Bridge Lane, between Salters Way and the EfW CHP Facility Site access, where vehicle flows associated with the operations will consist of HGVs, and a small number of light vehicles).

7.9.72 Predicted operational noise levels are assessed below in **Table 7.38 Operational noise assessment: non-residential Receptors**, with reference to the effect

magnitude criteria provided in **Table 7.23 Magnitudes of construction and operational noise affecting non-residential Receptors**.

Table 7.38 Operational noise assessment: non-residential Receptors

R. ID	Baseline sound level, dB $L_{Aeq,T}$	Predicted Weekday Operational Sound Level, dB $L_{Aeq,T}$	Sensitivity of Receptor	Magnitude of impact	Indicative Significance of effects
Daytime					
R16	58	65	Negligible	High	Moderate
R17	57	53	Negligible	Medium	Minor
R18	55	55	Negligible	Medium	Minor
R19	55	36	Negligible	Negligible	Negligible
R22	58	61	Negligible	Medium	Minor
R23	58	51	Negligible	Medium	Minor
R24	55	60	Negligible	Medium	Minor
R25	57	41	High	Negligible	Moderate
R27	58	46	Medium	Low	Moderate
R51	55	58	Negligible	Medium	Minor
R52	55	59	Negligible	Medium	Minor
R53	55	57	Negligible	Medium	Minor
Night-time					
R16	57	56	Negligible	Medium	Minor
R17	49	47	Negligible	Low	Negligible
R18	49	44	Negligible	Negligible	Negligible
R19	49	29	Negligible	Negligible	Negligible
R22	57	59	Negligible	Medium	Minor
R23	57	48	Negligible	Low	Negligible
R24	49	53	Negligible	Medium	Minor
R51	49	52	Negligible	Medium	Minor
R52	49	54	Negligible	Medium	Minor
R53	49	49	Negligible	Low	Negligible
R27	57	45	Negligible	Low	Negligible

7.9.73 The results in **Table 7.38 Operational noise assessment: non-residential Receptors** indicate that, during the daytime, operational noise is predicted to result in effects which are Negligible or Minor at most Receptor locations, which are **Not Significant**, and effects of Moderate significance at Receptors 16, 25 and 27, which are potentially significant. With regard to the potentially significant effects identified, based on the absolute level of the predicted operational sound levels, it is considered most unlikely that operational sound levels would give rise to any adverse effects or interfere with the normal operation of the Receptors in any way. On this basis it is considered that the potentially significant effects identified are **Not Significant**. In terms of the NPSE it is considered that daytime noise effects due to operational noise at non-residential Receptors are at the NOEL.

7.9.74 The results in **Table 7.38 Operational noise assessment: non-residential Receptors** indicate that, during the night-time, operational noise is predicted to result in effects of Negligible which are Minor at all Receptor locations and which

are **Not Significant**. In terms of the NPSE it is considered that night-time noise effects due to operational noise at non-residential Receptors are at the NOEL.

Start-up, maintenance, abnormal and emergency conditions

7.9.75 Variations in operational noise levels are likely to occur during start-up, abnormal and emergency operating conditions. Such conditions would be short-term and temporary.

7.9.76 There would be occasional noise sources that are active during start-up, abnormal or emergency conditions which do not form part of the normal operational noise. These sources primarily consist of steam venting and increased noise from the exhaust steam ducting to the ACC when it is necessary to bypass the turbine. Steam vents will be fitted with silencers to reduce noise emissions when venting occurs. Specific sound levels during turbine bypass mode have been predicted and are discussed below.

7.9.77 It is difficult to predict the frequency and duration of steam venting operations. However, these will tend to be of limited duration and would only occur under certain conditions. Individual steam releases may result in slight increases in audible noise from the EfW CHP Facility, but it is most unlikely that this would be of a level and duration that would give rise to any additional impacts beyond those identified in the assessment of operational noise, as steam vents will be fitted with silencers that will appropriately attenuate noise emissions from steam venting.

7.9.78 In emergency conditions, the primary focus must be the health and safety of personnel at the EfW CHP Facility and avoiding damage to any operational plant, and in any case, this will be controlled and maintained in accordance with the EP.

7.9.79 Use of the turbine bypass mode operations can typically range from 1 day to up to 3 weeks during turbine outages. Predictions of operational noise levels during turbine bypass mode operations have been undertaken based on the source levels as detailed in **Appendix 7C Operational Noise Assessment Data (Volume 6.4)** at the nearest residential Receptors. The results of the predictions indicate that operational noise levels may increase by 1 dB at the following Receptors:

- R5 (Newbridge Lane Caravan Park) during evenings and night-times on weekdays and weekends;
- R7 (The Chalet, New Drove) during all times of day on weekends and weekdays; and
- R8 (125 New Drove) during all times of day on weekends and weekdays, except weekday daytimes.

7.9.80 Increases of less than 1 dB are predicted at the other nearest residential Receptors during all times of day on weekdays and weekends.

7.9.81 All residential Receptors are of Medium sensitivity. With reference to the numerical assessments of operational noise presented above in **Table 7.34 BS 4142:2014 Assessment: initial estimate of effect: weekdays** to **Table 7.37 Noise Change Calculation: Weekends**, and on the basis of the predicted noise levels during bypass mode operation described above, the predicted increases in operational sound levels at R5, R7 and R8 would not give rise to any increases in predicted

magnitudes during weekdays or weekends at any time of day. The magnitudes indicated by the BS 4142 initial estimate for the turbine bypass mode operation are therefore identical to that provided above in the assessment of operational noise during normal operation. Consideration of contextual aspects would be identical to those provided above in the assessment of operational noise during normal operation. Based on the Receptor sensitivities, and effects described above, the significance of effects due to operational noise during turbine bypass mode operations would be identical to those provided above in the assessment of operational noise during normal operation, and are as follows:

- Major effects at R2 and R3, which are **Significant**;
- Moderate effects at R2 and R3 on weekday evenings and night-times which are **Not Significant**;
- Moderate effects at R4 during weekday night-times which are **Not Significant**;
- Major effects on weekend daytimes at R2 which are **Significant**;
- Moderate effects on weekend daytimes at R3 which are **Not Significant**;
- Moderate effects at R2 and R3 during weekend evenings which are **Not Significant**;
- Moderate effects at R1, R2, R3 and R4 during weekend night-times which are **Not Significant**; and
- At all other Receptors and times of day, effects are of minor significance and are **Not Significant**.

7.9.82 Mitigation measures required to reduce and avoid the effects are detailed in **Section 7.10**.

Decommissioning

7.9.83 The environmental effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration of one year. Therefore, the likely significance of effects relating to the construction phase assessment will be applicable to the decommissioning phase. However, the land south of the site access would likely be more industrial than it is currently, if proposals in the Local Plan allocations are developed. There would therefore be the potential for reduced impacts if any residential Receptors are removed or if ambient sound levels have increased due to additional industrial and/ or commercial developments being in operation.

7.9.84 Potential decommissioning noise and vibration impacts would occur in the short-term and would be controlled through selection of quieter plant, modification to the decommissioning programme, and the provision of local screening, where necessary. Control of noise and vibration emissions during the decommissioning process will be secured through a Decommissioning Environmental Management Plan (DEMP) which will be a DCO Requirement.

Monitoring

Construction noise

7.9.85 Where Receptors may be exposed to construction noise for extended periods, or could be exposed to construction noise levels which may exceed the BS 5228-1 thresholds set out in **Appendix 7A Baseline Monitoring report (Volume 6.4)**, noise monitoring may be required to quantify construction noise levels. Results of monitoring should be used to identify any potential impacts, inform investigations into the cause of any impacts and to aid in the determination of additional mitigation measures, as appropriate, to reduce and avoid the impacts identified.

7.9.86 Monitoring may consist of long-term monitoring at fixed locations or of short-term spot measurements, as appropriate. Further details of the monitoring which may be required are provided within the **Construction Noise and Vibration Management Plan** in the **Outline CEMP (Volume 7.12)**. Requirement for the construction phase to be undertaken in accordance with a final CEMP, consistent with the **Outline CEMP (Volume 7.12),** will be secured through a DCO Requirement.

Construction vibration

7.9.87 Where vibratory rollers may be in operation in close proximity to dwellings on New Bridge Lane, and there is the potential for cosmetic building damage, building conditions should be assessed prior to and after the construction phase, and any damage made good. Requirements for building condition surveys and any vibration monitoring which may be required are provided the **Outline CEMP (Volume 7.12)**. Requirement for the construction phase to be undertaken in accordance with a final CEMP, consistent with the **Outline CEMP (Volume 7.12),** will be secured through a DCO Requirement.

Operational noise

7.9.88 Once the Proposed Development is constructed, commissioned, and operating normally, operational noise levels will be monitored to confirm that operational noise levels would not give rise to any significant effects. The methodology for operational noise monitoring, including the locations and duration of monitoring, and the criteria to be met, will be agreed in advance with the local authorities and the Environment Agency, as secured by a requirement in the EP.

Summary

7.9.89 A summary of the results of the assessment of the likely significant effects during the construction and operation of the Proposed Development with respect to noise and vibration is provided in **Table 7.39. Summary of significance of adverse effects.**

Table 7.39 Summary of significance of adverse effects

Summary of predicted effects	Sensitivity/ importance/ value of Receptor[1]	Receptors and magnitude [2]	Significance[3]	Summary rationale
Receptors where construction noise is confirmed to result in effects which **are significant**	Residential: medium	Residential Receptors, medium to high magnitude: R2, R3, R4, R5	Residential: major to moderate	Receptors in close proximity to the EfW CHP Facility are predicted to be exposed to higher construction noise levels over longer durations than Receptors further away from the EfW CHP Facility.
	Industrial & commercial: negligible	Industrial & commercial Receptors, high magnitude: R16, R17, R18, R22, R23, R24	Industrial and commercial: major to moderate	Recommendations for mitigation to avoid the significant effects identified are provided in **Section 7.10**.
Receptors where construction noise is confirmed to result in effects which **are not significant**	Residential: medium	Residential Receptors, medium to high magnitude: R31 – R39, R44 – R49	Residential, impacts of high to medium magnitude: major to moderate	Receptors further from the EfW CHP Facility are generally predicted to be exposed to lower construction noise levels over shorter durations than Receptors in close proximity to the EfW CHP Facility.
		Residential Receptors, negligible to low magnitude: R1, R7, R9, R10, R50	Residential, impacts of negligible to low magnitude: moderate to low	In cases where indicative effects are significant at residential Receptors, durations of noisy works are limited and hence significant effects will be avoided.
	Industrial & commercial: negligible	Industrial & commercial Receptors, negligible to medium magnitude: R19, R20, R21	Industrial and commercial: major or moderate to minor	
	School: medium	School, medium magnitude: R27	School, moderate or major	At the School, predicted construction noise levels do not exceed baseline noise levels, and will not interfere with its normal operation, therefore significant effects will be avoided.

Summary of predicted effects	Sensitivity/ importance/ value of Receptor[1]	Receptors and magnitude [2]	Significance[3]	Summary rationale
	Eye Clinic: High	Eye Clinic, negligible to high magnitude: R25	Eye Clinic, moderate to major	At the Eye Clinic, consideration of the absolute levels of predicted construction noise levels indicates that adverse effects would be unlikely.
Receptors where construction vibration is confirmed to result in effects which **are significant**	Residential: Medium	R2, medium to high magnitude	Moderate to major	Construction vibration levels could be perceived and could give rise to cosmetic building damage at R2. Recommendations for mitigation to avoid the significant effects identified are provided in **Section 7.10**.
Receptors where construction vibration is confirmed to result in effects which **are not significant**	Residential: medium Industrial & commercial: negligible	Residential, low magnitude: R3 Industrial & commercial Receptors, negligible magnitude: R17, R18.	Residential: moderate or major Industrial & commercial, impacts of negligible magnitude: negligible	Though vibration may be perceptible at times, it is unlikely that any building damage would occur at R3, R17 or R18.
Receptors where construction traffic noise is confirmed to result in effects which **are not significant**	Residential: medium Industrial & commercial: negligible Schools: medium	Receptors within 50m of Algores Way and New Bridge Lane: f low magnitude Receptors within 50m of all other road links assessed: negligible magnitude	Receptors within 50m of Algores Way and New Bridge Lane: Residential: moderate, Industrial & commercial: minor, Schools: moderate Receptors within 50m of all other road links assessed: negligible	Exceedances of the threshold criteria for low impacts are small, and impacts would be temporary. Absolute noise levels are unlikely to give rise to any adverse effects.

Summary of predicted effects	Sensitivity/ importance/ value of Receptor[1]	Receptors and magnitude [2]	Significance[3]	Summary rationale
Receptors where, during the construction and operational phase, vehicle induced vibration is confirmed to result in effects which **are significant**	Residential: medium	Residential, low magnitude: R2	Residential: moderate	The dwelling at this Receptor is in closest proximity to New Bridge Lane and will experience the most significant increase in HGV movements, as there are currently negligible vehicle movements passing this location. Recommendations for mitigation to avoid the significant effects identified are provided in **Section 7.10**.
Receptors where, during the construction and operational phase, vehicle induced vibration is confirmed to result in effects which are **not significant**	Residential: medium Industrial & commercial: negligible	Residential, negligible magnitude: R1, R3 Industrial & commercial Receptors, low magnitude: R17, R19.	Residential: minor Industrial & commercial: negligible	It is considered unlikely that increased levels of vehicle induced vibration would give rise to any significant effects at Receptors further from New Bridge Lane where there are significant baseline flows of HGVs.
Receptors where operational traffic noise is confirmed to result in effects which **are not significant**	Residential: medium Industrial & commercial: negligible	Receptors within 50m of New Bridge Lane, up to Salters Way: medium magnitude Receptors within 50m of all other road links assessed: negligible magnitude	Receptors within 50m of New Bridge Lane, up to Salters Way: Residential: moderate or major, Industrial & commercial: minor Receptors within 50m of all other road links assessed: negligible	Though the increase in traffic noise may be noticeable in the opening year, the long-term significance would tend towards moderate or negligible, and is therefore considered not significant.

Summary of predicted effects	Sensitivity/ importance/ value of Receptor[1]	Receptors and magnitude [2]	Significance[3]	Summary rationale
Receptors where noise from the operational EfW CHP Facility is confirmed to result in effects which **are significant**	Residential: medium	Residential, high magnitude: R2, R3	Residential: major	Results of the BS 4142 initial estimate of impact and consideration of context indicates significant effects are likely during weekday daytimes at R2 and R3 and on weekend daytimes at R2.
Receptors where noise from the operational EfW CHP Facility is confirmed to result in effects which **are not significant**	Residential: medium Industrial & commercial: negligible School: medium Eye Clinic: High	Residential, low to negligible magnitude: R1, R4 – R10 Industrial & commercial Receptors, f low to high magnitude: R16, R17, R18, R19, R22, R23, R24, R51, R52, R53 School, low magnitude: R27 Eye Clinic, negligible magnitude: R25	Residential: moderate to minor Industrial & commercial: moderate to negligible School: moderate Eye Clinic: moderate	Consideration of absolute sound levels and ambient noise change indicates that significant effects would not occur.

1. The sensitivity/importance/value of a Receptor is defined using the criteria set out in Section 7.8 above and is defined as negligible, low, medium, and high.
2. The magnitude of change on a Receptor resulting from activities relating to the development is defined using the criteria set out in **Section 7.8** above and is defined as negligible, low, medium, and high.
3. The significance of the environmental effects is based on the combination of the sensitivity/importance/value of a Receptor and the magnitude of change and is expressed as major (significant), moderate (probably significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 7.8.**

7.10 Consideration of optional additional mitigation or compensation

7.10.1 The assessment of likely significant effects due to noise and vibration arising from the construction and operation of the Proposed Development, presented in **Section 7.9**, identified significant effects at some Receptor locations. Significant effects are predicted to occur due to the following aspects:

- Construction noise;
- Construction vibration;
- Vehicle induced vibration during the construction and operational phases at 9 New Bridge Lane (R2); and
- Operational noise.

7.10.2 This section sets out additional mitigation measures which will reduce the significance of the effects such that they are not significant.

Construction noise

7.10.3 Mitigation measures to reduce the significant effects identified in the assessment of construction noise are discussed in detail in **Appendix 7B Construction Noise Assessments (Volume 6.4)**. A summary is provided below.

Residential Receptors

7.10.4 Significant effects identified have been predicted on the basis of draft construction plant lists and the draft construction programme. The draft plant lists have been prepared on a conservative basis to represent a likely worst-case over the duration of the construction programme and reflects the current understanding of the likely plant requirements. Actual selection of plant and plant on-times are subject to change once the Proposed Development is consented and an EPC contractor is appointed. As such, it is considered that the predicted construction noise levels are representative of a worst-case, and that actual construction noise levels would likely be lower than predicted, for the majority of the duration of the works. The assessment is therefore representative of the envelope in which noise impacts may occur, whilst in practice the noise impacts may be lower than predicted.

7.10.5 When detailed construction schedules are available, these will likely indicate reduced plant requirements over specific durations of the construction programme. Review of a draft detailed schedule and plant list for the Access Improvements indicates that, over the duration of the works, the total sound power of the plant required was 7 dB lower than that used to inform the assessment. This is an example of the reduction that may be expected when considering a more detailed construction programme, as compared to the worst-case input data used for the assessment, representative of the envelope in which construction noise impacts could occur.

7.10.6 Precise mitigation requirements would be determined following appointment of a contractor, when a detailed construction schedule and list of likely plant requirements will be available. At this time, a final CEMP will be prepared consistent

with the **Outline CEMP (Volume 7.12),** which will set out the mitigation measures required to avoid significant effects. Construction works will be required to be undertaken in accordance with the CEMP, as secured through a DCO Requirement. Determination of the precise mitigation measures will be informed by review of the input data and outcomes of the assessments provided in **Appendix 7B Construction Noise Assessments (Volume 6.4)**. Review of the information should be undertaken with reference to the exceedances of the BS 5228-1 thresholds identified, and the construction plant lists used in the assessment. Comparisons should be made with the detailed plant requirements and construction schedule, to identify differences in overall sound power, to indicate the potential for significant effects.

7.10.7 In some cases, potentially significant effects were indicated by the numerical assessment, but consideration of the duration of the works indicated that, as worst-case construction noise levels would only be expected to occur over a very limited duration, significant effects would not occur. However, in these cases, construction noise emissions should be controlled and reduced as far as reasonably practicable, in accordance with best practice, as set out in the **Outline CEMP (Volume 7.12)**, to avoid and minimise any impacts. Receptors in close proximity to any construction works should be informed about the nature of works scheduled to be undertaken, with the provision of information detailing the type, extent, and duration of the works.

7.10.8 Where Receptors may be exposed to construction noise for extended periods, noise monitoring may be required to quantify construction noise levels. Results of monitoring should be used to identify any potential impacts, inform investigations into the cause of any impacts and to aid in the determination of additional mitigation measures, as appropriate, to reduce and avoid the impacts identified.

7.10.9 The following paragraphs set out potential measures, in addition to the best practice measures stated in the **Outline CEMP (Volume 7.12)**, which may be used to control construction noise levels and avoid significant effects, based on the results of the assessment.

7.10.10 Measures to reduce construction noise levels affecting residential Receptors may include, but not be limited to (in order of effectiveness, following the ‘source, path, receiver' hierarchy of noise control):

- Selection of quieter plant;
- Use of alternative construction methods;
- Programming of activities to avoid overlapping intensive works in the vicinity of the closest Receptor locations;
- Provision of local screening; and
- In cases where, despite the implementation of the above or other methods, significant effects cannot be avoided, then additional noise insulation may be provided or temporary rehousing offered. Criteria triggering eligibility for additional noise insulation or temporary rehousing is provided in **Appendix 7B Construction Noise Assessments (Volume 6.4)**.

7.10.11 In addition to the above measures, the Applicant is in discussion with the owner of 9 New Bridge Lane with a view to purchasing the property. The DCO also includes

for powers of compulsorily acquisition. Either way removal of this property as a sensitive Receptor will avoid significant effects during the construction and operational phases. Therefore, any significant effects identified at 9 New Bridge Lane will not occur and there would be no residual effects at this Receptor.

7.10.12 An acoustic fence is proposed for 10 New Bridge Lane, to avoid significant effects during the operational phase. It is proposed that the acoustic fence is constructed at the outset of the construction phase, as this would serve to reduce construction noise levels at this Receptor. This will be secured via a DCO Requirement.

7.10.13 Based on the implementation of the approach outlined above, residual effects at residential Receptors would be **Not Significant**.

Non-residential Receptors

7.10.14 The same considerations presented above in paragraphs 7.10.4 to 7.10.6 regarding the worst-case nature of the assessment, and review of detailed information on the construction plant and schedule following appointment of the construction contractor, also apply to the control and avoidance of significant effects at non-residential Receptors.

7.10.15 Significant effects have been identified at the Receptors closest to the EfW CHP Facility and TCC on the basis of Receptor locations representative of the nearest points on nearby industrial and commercial premises to the EfW CHP Facility Site boundary. It is considered that the potential for actual impacts should be confirmed by liaison with the operators of adjacent industrial and commercial premises, to confirm precise locations where noise sensitive activities occur or where there is potential for construction noise to interfere with the audibility of plant/vehicle movement alarms.

7.10.16 Confirmation of noise sensitive locations through liaison with the operators of the adjacent industrial and commercial premises may be used to determine appropriate boundary noise monitoring locations at specific points on the EfW CHP Facility Site boundary representative of noise sensitive locations.

7.10.17 The EfW CHP Facility Site boundary construction noise level criteria may be determined based on the distance from the boundary locations to the noise sensitive locations identified by the site operators, accounting for propagation distance and the sensitivity of the location identified.

7.10.18 In general, noise levels from construction activities should be monitored to ensure that a total ambient sound level of 75 dB $L_{Aeq,T}$ is not exceeded at any noise sensitive location identified by the site operators, except where baseline ambient sound levels (in the absence of construction noise) are already in excess of this limit. Where measured construction sound levels exceed the construction noise level criteria, action should be taken to investigate the cause of the exceedance and identify appropriate measures to reduce noise emissions from the specific activities giving rise to the exceedances.

7.10.19 Construction noise will be controlled through the measures set out in the Outline **CEMP (Volume 7.12)**, and in a final CEMP, and the thresholds of significance and/ or construction noise limits set out therein, as secured through a DCO Requirement.

Thresholds of significance/construction noise limits/baseline sound levels may need to be periodically reviewed to ensure appropriate controls are in place.

7.10.20 Measures to control and reduce construction noise emissions giving rise to any exceedances that may cause adverse effects may include, but not be limited to (in order of effectiveness, following the 'source, path, receiver' hierarchy of noise control):

- Selection of quieter plant;
- Reducing intensity of works;
- Scheduling works to avoid multiple activities near to noise sensitive locations;
- Scheduling works to avoid noise sensitive times of day;
- Provision of local screening;
- Provision of boundary screening;
- Provision of enhanced façade treatments to reduce received construction noise levels in office spaces; and
- Provision of plant movement alarms that vary the loudness level according to ambient noise levels.

7.10.21 Based on the implementation of the approach outlined above, residual effects at non-residential Receptors would be **Not Significant.**

Construction vibration

7.10.22 The assessment of construction vibration identified significant effects at residential Receptors located within 20m of vibratory rollers required for works on the Access Improvements. Significant effects could arise due to human perception of construction vibration and possible cosmetic building damage.

7.10.23 To address human perception of construction vibration, residents in close proximity to vibratory rollers should be informed of the nature, extent and duration of the works being undertaken. As the potential for annoyance due to construction vibration is considered to be limited by the duration of the works, and as worst-case vibration levels are only anticipated during brief moments when vibratory rollers are in closest proximity to dwellings, it is considered that informing local residents of the works will be an adequate control to reduce the potential for annoyance. Though construction vibration levels may briefly exceed the criterion for a high impact magnitude provided in **Table 7.24 Magnitudes of construction vibration affecting dwellings**, this should be acceptable to nearby residents if they are made aware that such occurrences will be limited in duration and number. On the basis of the above it is considered that any residual effects would be **Not Significant**.

7.10.24 To address the potential for cosmetic building damage to residential premises within 20m of vibratory rollers, it is recommended that building condition surveys be undertaken before and after the works, and any damage made good. On the basis of the above it is considered that any residual effects would be **Not Significant**.

Vehicle induced vibration

7.10.25 The assessment of vehicle induced vibration identified significant effects at 9 New Bridge Lane (R2) during the construction and operational phases. To mitigate significant effects due to operational noise, this dwelling will be acquired either through agreement or with compulsory powers by the Applicant and will be taken out of residential use. This removes this dwelling as a sensitive Receptor. There will therefore be no adverse residual effects at this Receptor and, as such, residual effects will be **Not Significant**. The acquisition of this dwelling by the Applicant will be secured through the DCO.

7.10.26 Though it is anticipated that effects at 2 New Bridge Lane (R1) due to vehicle induced vibration would be **Not Significant**, it is recommended that a building condition survey be undertaken prior to the construction phase such that, if deterioration of the dwelling's condition is reported, there is a pre-development baseline to compare against.

Operational noise

7.10.27 The assessment of operational noise identified significant effects at the nearest residential Receptors to the EfW CHP Facility, 9 and 10 New Bridge Lane (R2 and R3, respectively). Significant effects are predicted to occur at R2 during weekday and weekend daytimes, and at R3 on weekday daytimes.

9 New Bridge Lane (R2)

7.10.28 To mitigate the significant effects identified, this dwelling will be acquired by the Applicant and will be taken out of residential use. This removes this dwelling as a sensitive Receptor. There will therefore be no adverse residual effects at this Receptor and, as such, residual effects will be **Not Significant**. The acquisition of this dwelling by the Applicant will be secured through the DCO.

10 New Bridge Lane (R3)

7.10.29 Investigations into the attenuation that could be achieved with an acoustic fence to 10 New Bridge Lane have been undertaken. The results indicate that, with an acoustic fence of approximately 49m length and 3m height, within the property of 10 New Bridge Lane and in close proximity to the boundary, significant attenuation could be achieved. A diagram indicating the location of the proposed acoustic fence is provide in **Figure 7.13 Proposed acoustic fence to 10 New Bridge Lane**. Model results indicate that the acoustic fence outlined above could achieve respective attenuations of 7 dB, 4 dB and 3 dB during the daytime, evening and night-time respectively.

7.10.30 With regard to the significant effects identified during weekday daytimes, and the additional attenuation provided by the acoustic fence outlined above, the outcomes of the assessment would be as follows. The initial estimate of effect would reduce to +6 dB above background, indicating a medium magnitude and a Moderate or Major effect, which is potentially significant. The predicted ambient noise increase in the daytime would be +2 dB, which indicates a Low magnitude and Moderate effect which is potentially significant. As the predicted total ambient noise increase

is Low, it is considered that the Moderate or Major effect identified in the initial estimate would be Moderate and **Not Significant**.

7.10.31 Predictions indicate that, when the EfW CHP Facility is operating in turbine bypass mode, identical outcomes would be predicted as compared to the normal operation mode, as outlined above, and hence resultant effects would be **Not Significant**.

7.10.32 Based on the approach outlined above, entailing provision of an acoustic fence to 10 New Bridge Lane, residual effects due to operational noise would be **Not Significant**.

7.10.33 The fence should have no gaps and have a minimum surface mass of 10 kg/m^2. Solid automated doors will be provided for the vehicular access to the property and, if required, solid doors will also be provided to the access to the field to the west of the property. The doors should be designed to minimise gaps as far as reasonably practicable. The provision of the acoustic fence, including provision of full design details, will be secured through a DCO Requirement.

7.10.34 In terms of the beneficial effects of the acoustic fence during the construction phase, significant effects due to construction noise are predicted to occur at 10 New Bridge Lane as early as month 2 of the construction programme. It is therefore recommended that the construction of the acoustic fence occurs at the beginning of the construction programme. If, for any reason, this is not practicable or feasible, then significant effects due to construction noise at 10 New Bridge Lane could still be avoided through application of the mitigation measures described under paragraph 7.10.10.

7.11 Implementation of environmental measures

7.11.1 **Table 7.40 Summary of indicative environmental measures to be implemented – relating to noise and vibration** describes the environmental measures embedded within the Proposed Development and the proposed means by which they will be implemented.

Table 7.40 Summary of indicative environmental measures to be implemented – relating to noise and vibration

Environmental measure	Responsibility for implementation	Proposed Compliance mechanism	ES section reference
Undertaking construction in accordance with good practice. Where the potential for significant effects arises, applying BPM in accordance with the recommendations in BS 5228:1-2009+A1:2014.	Applicant/Contractor	DCO Requirement **Outline CEMP (Volume 7.12)**	**Section 7.7**
Where there is the potential for significant effects due to construction vibration, informing occupants of nearby buildings of the nature and extent of works, and	Applicant/Contractor	DCO Requirement **Outline CEMP (Volume 7.12)**	**Section 7.10**

Environmental measure	Responsibility for implementation	Proposed Compliance mechanism	ES section reference
undertaking building condition surveys before and after the construction phase and making good any damage caused by construction vibration.			
Except in emergency circumstances, all out of core hours works planned in advance with the potential to give rise to significant noise emissions will be subject to agreement with the relevant local authorities.	Applicant/Contractor	DCO Requirement s61 consents/ written agreement from the relevant local authorities	**Section 7.7**
Construction of major process buildings and selection of plant in accordance with the design parameters as detailed in the ES, and in accordance with Best Available Techniques (BAT) as required for the Environmental Permit (EP).	Applicant/Contractor	DCO Requirement EPC contract EP	**Section 7.7** & **Appendix 7D Outline Operational Noise Management Plan (Volume 6.4)**
Compulsory acquisition of 9 New Bridge Lane to avoid significant effects due to vehicle induced vibration during the construction and operational phases and operational noise from the EfW CHP Facility.	Applicant/Contractor	DCO Requirement	**Section 7.10**
During normal operations, limitation on the hours of waste deliveries from 0700 to 2000 hours.	Site operator	DCO Requirement	**Section 7.7**
Construction of acoustic fence at 10 New Bridge Lane to avoid significant effects during operational phase.	Applicant/Contractor	DCO Requirement	**Section 7.10**
Operational noise monitoring **&** **Operational noise management and control measures set out in the Operational Noise Management Plan**	Site operator	DCO Requirement EP Operational Noise Management Plan	**Section 7.9** & **Appendix 7D Outline Operational Noise Management Plan (Volume 6.4)**

7.12 Conclusion

7.12.1 This chapter presents the environmental assessment of the likely significant effects during the construction and operation of the Proposed Development with respect to noise and vibration.

7.12.2 The assessment of construction vibration, presented in **Section 7.9**, has concluded that, during the construction phase, significant effects are likely at 9 New Bridge Lane. Significant effects due to construction vibration are unlikely at all other locations assessed. Additional mitigation measures to avoid significant effects due to construction vibration at 9 New Bridge Lane are set out in **Section 7.10**. With the additional mitigation measures, impacts will be reduced such that the resultant effects are **Not Significant**.

7.12.3 The assessment of construction noise, presented in **Appendix 7B Construction Noise Assessments (Volume 6.4)**, and summarised in **Section 7.9,** has concluded that, during the construction phase, significant effects are likely at residential Receptors at 9 and 10 New Bridge Lane, the dwelling known as 'Potty Plants' at the south end of New Bridge Lane and at New Bridge Lane Traveller site, during specific phases of the construction programme. With regard to non-residential Receptors, significant effects due to construction noise are likely at industrial and commercial premises adjacent to the EfW CHP Facility Site, during specific phases of the construction programme. Significant effects due to construction noise are unlikely at all other locations assessed, throughout the construction programme. Additional mitigation measures to avoid significant effects at residential and non-residential premises due to construction noise are set out in **Section 7.10**. With the additional mitigation measures, impacts will be reduced such that the resultant effects are **Not Significant**.

7.12.4 The assessment of increases in road traffic noise during construction and operation of the Proposed Development, presented in **Section 7.9**, has concluded that significant effects are unlikely at all locations assessed.

7.12.5 The assessment of increases in vehicle induced vibration during construction and operation of the Proposed Development, presented in **Section 7.9**, has concluded that significant effects are likely at 9 New Bridge Lane. Significant effects due to vehicle induced vibration are unlikely at all other locations assessed. Additional mitigation measures to avoid significant effects at 9 New Bridge Lane due to vehicle induced vibration are set out in **Section 7.10**. With the additional mitigation measures, impacts will be reduced such that the resultant effects are **Not Significant**.

7.12.6 The assessment of operational noise, presented in **Section 7.9**, has concluded that, during the operational phase, significant effects are likely at the nearest dwellings at 9 and 10 New Bridge Lane. Significant effects due to operational noise are unlikely at all other residential and non-residential locations assessed. Additional mitigation measures to avoid significant effects due to operational noise are set out in **Section 7.10**. With the additional mitigation measures, impacts will be reduced such that the resultant effects are **Not Significant**.

7.13 References

Association of Noise Consultants and the Institute of Acoustics, (Version 6) January 2021. Joint Guidance on the Impact of COVID-19 on the Practicality and Reliability of Baseline Sound Level Surveying and the Provision of Sound & Noise Impact Assessments. ANC & IOA.

British Standards Institution, 1993. BS 7385 part 2. BSI, London.

British Standards Institution, 2014. BS 5228-1:2009 + A1:2014 Code of construction practice for noise and vibration control on construction and open sites – Part 1: Noise. BSI, London.

British Standards Institution, 2014. BS 5228-2:2009 + A1:2014 Code of construction practice for noise and vibration control on construction and open sites – Part 2: Vibration. BSI, London.

British Standards Institute, 2014, BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. BSI, London

British Standards Institution, 1997. BS 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas. BSI, London.

British Standards Institution, 2019. BS 4142:2014 + A1:2019 Methods for rating and assessing industrial and commercial sound. BSI, London.

Cambridgeshire County Council and Peterborough City Council, 2021. Minerals and Waste Local Plan. Adopted July 2021.

DEFRA, 2010. Noise Policy Statement for England.

Department for Energy & Climate Change, 2011. National Policy Statement for Electricity Networks Infrastructure (EN-5).

Department for Energy & Climate Change, 2011. National Policy Statement for Renewable Energy Infrastructure (EN-3).

Department for Energy & Climate Change, 2011. Overarching National Policy Statement for Energy (EN-1).

Department for Energy & Climate Change, 2021. Draft National Policy Statement for Electricity Networks Infrastructure (EN-5).

Department for Energy & Climate Change, 2021. Draft National Policy Statement for Renewable Energy Infrastructure (EN-3).

Department for Energy & Climate Change, 2021. Draft Overarching National Policy Statement for Energy (EN-1).

Department of Transport, 30 March 2022. Domestic transport use by mode: Great Britain, since 1 March 2020. ‘Covid-19-transport-use-statistics.ods’.

Fenland District Council, 2014. Delivering and Protecting High Quality Environments in Fenland Supplementary Planning Document.

Fenland District Council, 2014. Fenland Local Plan.

Highways England, Transport Scotland, Welsh Government and Department for Infrastructure, 2020. Design Manual for Roads and Bridges LA111: Noise and vibration. Revision 2.

HMSO, 1974. Control of Pollution Act 1974.

HMSO, 1990. Environmental Protection Act 1990.

HMSO, 1998. Calculation of Road Traffic Noise.

HMSO, 2016. Environmental Permitting Regulations (as amended).

IEMA, November 2014. Guidelines for environmental noise impact assessment, Version 1.2.

International Standards Organisation, 1991. ISO 1996:1982 (BS 7445:1991) Description and measurement of environmental noise. BSI, London.

International Standards Organisation, 1996. ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation. ISO, London.

King's Lynn and West Norfolk Borough Council, 2011. Local Development Framework – Core Strategy.

King's Lynn and West Norfolk Borough Council, 2016. Site Allocations and Development Management Policies Plan.

Ministry of Housing, Communities and Local Government, 2021. National Planning Policy Framework.

Ministry of Housing, Communities and Local Government, 2019. National Planning Practice Guidance.

National Grid, 1993. TR(T)94 – A Method for Assessing the Community Response to Overhead Line Noise, Issue 1. National Grid Technology & Science Laboratories.

Norfolk County Council, 2011, Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD

The Building Performance Centre, School of the Built Environment, Napier University, 2007. NANR116: Open/Closed Window Research – Sound Insulation through Ventilated Domestic Windows.

The Planning Inspectorate. Scoping Opinion: Proposed Medworth Energy from Waste Combined Heat and Power Facility. Case Reference: EN010110. January 2020.

World Health Organisation, 1999. Guidelines for Community Noise. WHO, Geneva.