



Rainham Landfill

Environmental Statement – Volume 2

Chapter 6.0 - Noise

Prepared for



Veolia ES Cleanaway (UK)

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Well House Barns, Chester Road, Bretton, Chester, CH4 0DH

Camelia House, 76 Water Lane, Wilmslow, Cheshire, SK9 5BB

T: 0344 8700 007
enquiries@axis.co.uk
www.axis.co.uk

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6.0 NOISE & VIBRATION

6.1 Introduction

6.1.1 This chapter assesses the impact of the Proposed Development with regard to noise. It describes the methods used to assess the impacts, the baseline conditions that currently exist at the site and the potentially affected nearest sensitive receptors ('NSR'), the possible direct and indirect impacts arising from the Proposed Development and the mitigation measures that could be implemented to reduce noise impact from the Proposed Development.

6.1.2 The assessment includes the consideration of:

- information on typical existing sound climate;
- information on the noise levels from site noise sources;
- outline of the likely evolution of the future baseline sound levels;
- information and predictions on the noise impact from infilling of voids, restoration and composting works;
- information on the noise impact on NSR associated with the movement of HGVs;
- details of potential cumulative effects where noise from other potential developments may also affect the same NSR;
- noise mitigation measures to meet 'best practicable means' ('BPM').

6.1.3 In terms of effects from vibration, as there are no activities proposed that involve any operation of any significant vibratory plant and vibration from site operations would not be perceptible at NSR, vibration has been scoped out of the operational assessment.

6.1.4 Appendix 6.1 provides details of technical terms within the chapter, and a chart showing typical everyday noise levels to assist in understanding the subjective level of noise in terms of decibels. For vibration there is also a chart showing typical levels for different activities.

6.2 Proposed Development



- 6.2.1 This Environmental Statement has been prepared by Axis, on behalf of Veolia Environmental Services ('Veolia'), in support of a planning application to extend the period landfilling and composting operations and the date for restoration at the Rainham Landfill Site (the Site).
- 6.2.2 Planning permission P1566.12 was granted by the London Borough of Havering on 22 September 2016 for: *"The continuation of waste inputs and operation of other waste management facilities...until 2024 and re-profiling of final contours".....* at Veolia Rainham Landfill, Coldharbour Lane, Rainham.
- 6.2.3 Planning Permission was granted subject to 24 conditions. Condition 2 requires that: *"Waste disposal and all other processing operations cease on or before 31st December 2024 and restoration shall be completed by the 31st December 2026, in accordance with the scheme approved under condition 4..."*
- 6.2.4 This application is to allow waste disposal and open windrow composting operations to continue until 31 December 2029, with restoration to be completed by 31 December 2031. A revision to the landfill phasing is also proposed to reflect current and proposed operational requirements, although it should be noted that the previously approved phasing drawing is not included within the list of approved documents on decision P1566.12. The application also seeks to regularise the existing landfill ground levels.
- 6.2.5 A full description of the Rainham Landfill Site is provided in Chapter 3.0. The location of the Proposed Development (the Site) is shown on Figure 1.1.
- 6.2.6 It has been assumed that site operations and all vehicle and mobile plant movements would be restricted to the following hours of operation which are between:
- 0700 hours and 1600 hours Mondays to Fridays
 - 0700 hours and 1200 hours Saturdays
- 6.2.7 A sound survey has been carried out in the vicinity of the Proposed Development to determine existing representative background and residual sound levels. The aim of the sound survey was to:



- identify the existing baseline sound levels for use as a reference for background and residual sound levels in the assessment of impacts related to the operation of the Proposed Development;
- enable the assessment baseline to be established and understand the effects of existing developments on the future baseline; and
- characterise the nearest noise sensitive receptors (NSR) or noise sensitive sites.

6.2.8 The methodology and approach to the sound survey and assessment included the following:

- establishing the nearest NSR;
- evaluation of present and assessment background and ambient sound levels;
- evaluation of noise sources from the Proposed Development in terms of typical operating levels;
- assessment of specific noise sources in relation to appropriate guidance and standards (e.g. Planning Policy Guidance on Minerals, BS5228:2009+A1:2014); and
- identification of any noise control necessary where noise generated from the Proposed Development has been identified as exceeding noise limits.

Competence

6.2.9 The author of this assessment has over 40 years' experience in the field of industrial and environmental acoustics with a Masters' Degree in Acoustics and is a Member of the Institute of Acoustics, Member of the Association of Noise Consultants, Member of the Academy of Experts and an Incorporated Engineer.

6.3 Methodology and Scope of Assessment

Legislation and Guidance

General

6.3.1 To establish the impact of the Proposed Development in respect of noise on existing or proposed residential receptors it is necessary to consider the relevant noise guidance, standards and policy for a quarry restoration development. The following



section examines the guidance and establishes the methodology to be adopted for assessing noise impacts.

6.3.2 Information used in this assessment has been obtained from the following sources:

- Ordnance Survey maps of the local area;
- Phased workings of the Proposed Development;
- National Planning Policy Framework – December 2023¹;
- Noise Policy Statement for England (NPSE) – March 2010²;
- National Planning Practice Guidance (NPPG) July 2019³;
- BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'⁴;
- BS8233: 2014⁵;
- BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'⁶;
- World Health Organisation: 'Guidelines for Community Noise' - April 1999⁷;
- Design Manual for Roads and Bridges, LA 111 'Noise and Vibration'; May 2020⁸
- ISO 9613-2: 1996 Acoustics – Attenuation of Sound During Propagation Outdoors⁹;
- IEMA Guidelines for Environmental Noise Impact Assessment (November 2014)¹⁰;
- Veolia Rainham Landfill 2012 Application ES – Chapter 13: Noise¹¹
- Planning Consent Conditions (ref: P1566.12 dated 22nd September 2016)¹²

¹ National Planning Policy Framework – December 2023.

² Noise Policy Statement for England (NPSE) – March 2010²: Department for Communities and Local Government.

³ National Planning Practice Guidance – July 2019.

⁴ BS4142: 2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'.

⁵ BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'.

⁶ BS 5228:2009+A1:2014 Part 1 Noise & Part 2 Vibration 'Code of practice for noise and vibration control on construction and open sites'.

⁷ World Health Organisation: April 1999 - Guidelines for Community Noise.

⁸ Design Manual for Roads and Bridges, LA 111 Noise and Vibration (formerly HD 213/11).

⁹ ISO9613-2 2024: Acoustics – Attenuation of Sound During Propagation Outdoors.

¹⁰ IEMA Guidelines for Environmental Noise Impact Assessment (November 2014)

¹¹ Veolia Rainham Landfill 2012 Application ES – Chapter 13: Noise.

¹² Planning Consent Conditions (ref: P1566.12 dated 22nd September 2016).



- NVC Noise Impact Assessment report (ref. R22.0901/DRK dated 27th September 2022)¹³;
- Veolia Noise Mitigation Strategy pursuant to condition 6 of Planning Permission P1566.12 Rainham Landfill (January 2017) ¹⁴;
- Rainham Landfill Restoration Sequence (2023 onwards) Veolia Drawing No. RAI/ENG/983.2¹⁵.

National Planning Policy Framework: December 2023 (NPPF)

- 6.3.3 Chapter 15 of the National Planning Policy Framework (NPPF) relates to 'Conserving and enhancing the natural environment'.
- 6.3.4 Paragraph 180 e) refers directly to noise and states that: *"e) 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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans."*
- 6.3.5 Paragraph 191 also states: *"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;*

¹³ NVC Noise Impact Assessment report (ref. R22.0901/DRK dated 27th September 2022) Proposed Retention & Extension of Materials Recycling Facility (MRF) & Plastics Recycling Facility (PRF)

¹⁴ Veolia Noise Mitigation Strategy pursuant to condition 6 of Planning Permission P1566.12 Rainham Landfill (January 2017)

¹⁵ Rainham Landfill Restoration Sequence (2023 onwards) Veolia Drawing No. RAI/ENG/983.2



and

- c) *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*”

6.3.6 Section 17.0 of the NPPF ‘Facilitating the sustainable use of minerals’ provides details of the planning policies to be adopted, which includes:

“215. It is essential that there is a sufficient supply of minerals to provide the infrastructure, buildings, energy and goods that the country needs. Since minerals are a finite natural resource, and can only be worked where they are found, best use needs to be made of them to secure their long-term conservation.

216. Planning policies should:

- a) *provide for the extraction of mineral resources of local and national importance, but not identify new sites or extensions to existing sites for peat extraction;*
- b) *so far as practicable, take account of the contribution that substitute or secondary and recycled materials and minerals waste would make to the supply of materials, before considering extraction of primary materials, whilst aiming to source minerals supplies indigenously;*
- c) *safeguard mineral resources by defining Mineral Safeguarding Areas; and adopt appropriate policies so that known locations of specific minerals resources of local and national importance are not sterilised by non-mineral development where this should be avoided (whilst not creating a presumption that the resources defined will be worked);*
- d) *set out policies to encourage the prior extraction of minerals, where practical and environmentally feasible, if it is necessary for non-mineral development to take place;*
- e) *safeguard existing, planned and potential sites for: the bulk transport, handling and processing of minerals; the manufacture of concrete and concrete products; and the handling, processing and distribution of substitute, recycled and secondary aggregate material;*

- f) *set out criteria or requirements to ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, taking into account the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality;*
- g) *when developing noise limits, recognise that some noisy short-term activities, which may otherwise be regarded as unacceptable, are unavoidable to facilitate minerals extracting; and*
- h) *ensure that worked land is reclaimed at the earliest opportunity, taking account of aviation safety, and that high quality restoration and aftercare of mineral sites takes place.*

217. *When determining planning applications, great weight should be given to the benefits of mineral extraction, including to the economy. In considering proposals for mineral extraction, minerals planning authorities should:*

- a. *as far as is practical, provide for the maintenance of landbanks of non-energy minerals from outside National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage Sites, scheduled monuments and conservation areas;*
- b. *ensure that there are no unacceptable adverse impacts on the natural and historic environment, human health or aviation safety, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality;*
- c. *ensure that any unavoidable noise, dust and particle emissions and any blasting vibrations are controlled, mitigated or removed at source, and establish appropriate noise limits for extraction in proximity to noise sensitive properties;”*

Noise Policy Statement for England (NPSE)

- 6.3.7 The Noise Policy Statement for England (NPSE) was published in March 2010. It specifies the following long-term vision in policy aims: *“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:*



- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life.”*

6.3.8 The NPSE introduced three concepts to the assessment of noise, which includes:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise.

LOAEL – Lowest Observable Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

6.3.9 The above categories are however undefined in terms of noise levels and for the SOAEL the NPSE indicates that the noise level will vary depending upon the noise source, the receptor and the time of day/day of the week, etc. The need for more research is therefore required to establish what may represent an SOAEL. It is acknowledged in the NPSE that not stating specific SOAEL levels provides policy flexibility until there is further evidence and guidance.

6.3.10 The NPSE concludes how the LOAEL and SOAEL relate to the three aims listed in paragraph 6.2.8 above. The initial aim relates to avoiding significant adverse effects on health and quality of life, it then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when:

“all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.”



- 6.3.11 The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development.

Planning Practice Guidance (PPG) July 2019

- 6.3.12 In October 2014, the Ministry of Housing, Communities & Local Government updated the Planning Practice Guidance (“PPG”) on noise associated with Minerals, which provides guidance on the planning process. The main section of PPG was also updated in July 2019.
- 6.3.13 The main planning section of PPG includes a table summarising the noise exposure hierarchy, based on the likely average response to noise. Under the heading of ‘perception’ the ‘noticeable and not intrusive’ assessment of noise is defined as ‘noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such there is a perceived change in the quality of life’. The increasing effect level under these conditions is deemed to be ‘no observed adverse effect’ and no specific measures are required.
- 6.3.14 The PPG includes a table summarising the noise exposure hierarchy, based on the likely average response. Table 6.1 below provides the perception, example of outcome, effect and action required relative to noise:

Table 6.1 - Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect (NOEL)	No Specific Measures Required
Present and not intrusive	Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect (NOAEL)	No Specific Measures Required
Lowest Observed Adverse Effect Level (LOAEL)			
Present and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep	Observed Adverse Effect	Mitigate and reduce to a minimum

Response	Examples of Outcomes	Increasing Effect Level	Action
	disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.		
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

6.3.15 Within PPG there is a section on ‘*Guidance on the planning for mineral extraction in plan making and the application process*’ and under Paragraphs 019 to 021 (Reference ID: 27-019-20140306, 27-020-20140306 and 27-021-20140306) the guidance under ‘Noise emissions’ states:

“Noise emissions

How should minerals operators seek to control noise emissions?

Those making mineral development proposals, including those for related similar processes such as aggregates recycling and disposal of construction waste, should carry out a noise impact assessment, which should identify all sources of noise and, for each source, take account of the noise emission, its characteristics, the proposed operating locations, procedures, schedules and duration of work for the life of the operation, and its likely impact on the surrounding neighbourhood.

Proposals for the control or mitigation of noise emissions should:

- *consider the main characteristics of the production process and its environs, including the location of noise-sensitive properties and sensitive environmental sites;*



- *assess the existing acoustic environment around the site of the proposed operations, including background noise levels at nearby noise-sensitive properties;*
- *estimate the likely future noise from the development and its impact on the neighbourhood of the proposed operations;*
- *identify proposals to minimise, mitigate or remove noise emissions at source;*
- *monitor the resulting noise to check compliance with any proposed or imposed conditions.*

How should mineral planning authorities determine the impact of noise?

Mineral planning authorities should take account of the prevailing acoustic environment and in doing so consider whether noise from the proposed operations would:

- *give rise to a significant adverse effect;*
- *give rise to an adverse effect; and*
- *enable a good standard of amenity to be achieved.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.

What are the appropriate noise standards for mineral operators for normal operations?

Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A)



without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) LAeq, 1h (free field). For operations during the evening (1900-2200) the noise limits should not exceed the background noise level (LA90,1h) by more than 10dB(A) and should not exceed 55dB(A) LAeq, 1h (free field). For any operations during the period 22.00 – 07.00 noise limits should be set to reduce to a minimum any adverse impacts, without imposing unreasonable burdens on the mineral operator. In any event the noise limit should not exceed 42dB(A) LAeq,1h (free field) at a noise sensitive property.

Where the site noise has a significant tonal element, it may be appropriate to set specific limits to control this aspect. Peak or impulsive noise, which may include some reversing beepers, may also require separate limits that are independent of background noise (eg Lmax in specific octave or third-octave frequency bands – and that should not be allowed to occur regularly at night.)

Care should be taken, however, to avoid any of these suggested values being implemented as fixed thresholds as specific circumstances may justify some small variation being allowed.

What type of operations may give rise to particularly noisy short-term activities and what noise limits may be appropriate?

Activities such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms and aspects of site road construction and maintenance.

Increased temporary daytime noise limits of up to 70dB(A) LAeq 1h (free field) for periods of up to 8 weeks in a year at specified noise-sensitive properties should be considered to facilitate essential site preparation and restoration work and construction of baffle mounds where it is clear that this will bring longer-term environmental benefits to the site or its environs.

Where work is likely to take longer than 8 weeks, a lower limit over a longer period should be considered. In some wholly exceptional cases, where there is no viable alternative, a higher limit for a very limited period may be appropriate in order to



attain the environmental benefits. Within this framework, the 70 dB(A) LAeq 1h (free field) limit referred to above should be regarded as the normal maximum.”

BS5228-1:2009+A1:2014 Code of Practice for noise and vibration control on construction and open sites

- 6.3.16 In the foreword of this Standard it states ‘This British Standard refers to the need for the protection against noise and vibration of persons living and working in the vicinity of, and those working on, construction and open sites. It recommends procedures for noise and vibration control in respect of construction operations, and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.
- 6.3.17 Under the heading ‘Use of this document’ it states ‘As a code of practice, this part of BS5228 takes the form of guidance and recommendations. It should not be quoted as if it were a specification and particular care should be taken to ensure claims of compliance are not misleading.’
- 6.3.18 This scope of the standard is clarified as follows:
- ‘This part of BS5228 gives recommendations for basic methods of noise control relating to construction sites, including sites where demolition, remediation, ground treatment or related civil engineering works are being carried out, and open sites where work activities/operations generate significant noise levels, including industry-specific guidance.’*
- 6.3.19 The guidance gives specific advice in relation to noise control from mineral extraction workings.
- 6.3.20 In summary, advice provided within the document to minimise noise from these types of site is set out under the following headings:
- a) Site location and layout
 - b) Choice of equipment
 - c) Maintenance of plant
 - d) Site operations
 - e) Sequencing of activities

f) Acoustic screening

BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

6.3.21 BS4142: 2014 'Methods for rating and assessing industrial and commercial sound' is based on the measurement of background sound using L_{A90} noise measurements, compared to source noise levels measured in L_{Aeq} units. Once any corrections have been applied for source noise tonality, distinct impulses etc., the difference between these two measurements (i.e. known as the 'rating' level) determines the impact magnitude.

- Typically, the greater the difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact (although this can be dependent on the context).
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.
- 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 (although this can be dependent on the context).

6.3.22 In order to establish the rating level, corrections for the noise character need to be taken into consideration. As stated in BS4142 (Ref.: section 9.2 of BS4142: 2014+A1:2019 commentary on noise character) such noise characteristics include tonality, impulsivity and intermittency.

6.3.23 The application of BS4142 is **not appropriate** where there are other standards and guidance specific to the noise source, as stated in section 1.3 of the Standard. PPG mineral extraction guidance is the appropriate guidance as this has operated as a quarry, which is to be restored.



BS8233: 2014 'Guidance on sound insulation and noise reduction for buildings'

- 6.3.24 The British Standard BS8233 provides additional guidance on noise levels within buildings. These are based on the WHO recommendations and the criteria given in BS8233 for unoccupied spaces within residential properties.
- 6.3.25 The guidance provided in section 7.7 of BS8233 provides recommended internal ambient noise levels for resting, dining and sleeping within residential dwellings. Table 6.2 provides detail of the levels given in the standard.

Table 6.2 - Guidance on Sound Insulation and Noise Reduction for Buildings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq, 16\text{hours}}$	-
Dining	Dining room/area	40 dB $L_{Aeq, 16\text{hours}}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq, 16\text{hours}}$	30 dB $L_{Aeq, 8\text{hours}}$
Typical noise levels for acoustic privacy in shared spaces	Restaurant	40-55dB $L_{Aeq 12\text{hours}}$	
Study and work requiring concentration.	Staff/Meeting Room, Training Room Executive Office	35-45dB $L_{Aeq 8\text{hours}}$ 35-45dB $L_{Aeq 8\text{hours}}$	

- 6.3.26 This standard would be appropriate to apply to existing or proposed residential development. The Site noise contribution should be within the proposed internal noise levels, which would include the following noise limits:

Living room areas: $\leq 35\text{dB } L_{Aeq, 16\text{hours}}$ (0700-2300 hours) [equivalent to an external level of approximately $65\text{dB } L_{Aeq, 16\text{hours}}$ based on typical standard double-glazed units in the closed position and approximately $50\text{dB } L_{Aeq, 16\text{hours}}$ in the open position].

Offices: $\leq 35\text{dB } L_{Aeq, 8\text{hours}}$ [equivalent to an external level of approximately $65\text{dB } L_{Aeq, 8\text{hours}}$ based on typical standard double-glazed units in the closed position].

World Health Organisation (WHO) Guidelines for Community Noise: April 1999

- 6.3.27 This document provides further updated information on noise and its effects on the community. Within the document for noise '*In Dwellings*' it states that '*To enable casual conversation indoors during daytime, the sound level of interfering noise*



should not exceed 35dB L_{Aeq} . To protect the majority of people from being seriously annoyed during the daytime, the outdoor sound level from steady, continuous noise should not exceed 55dB L_{Aeq} on balconies, terraces and in outdoor living areas. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound level should not exceed 50dB L_{Aeq} . Where it is practical and feasible, the lower outdoor sound level should be considered the maximum desirable sound level for new development."

Road Traffic Noise

- 6.3.28 Access to the Site is from the A13 (Rainham Bypass), which forms part of the strategic road network, via Ferry Lane and Coldharbour Lane. Coldharbour Lane is an unclassified road which runs along the northern and eastern borders of the landfill site.
- 6.3.29 The DMRB LA 111 provides guidance on the magnitude of change in terms of road traffic noise. The procedure for assessing noise impacts advises the use of a LA_{10} measurement index based on a daytime 18-hour time period (i.e. 0600 to 2400 hours) and night-time period (i.e. 0000-0600 hours).
- 6.3.30 DMRB LA 111 defines the short term and long-term scenarios which are considered to represent the situation when a new road opens (short term) and 15 years after a road opens (long term). The magnitude of change criteria are set out in Table 6.3 for the short term and 6.4 for the long term.

Table 6.3 - Magnitude of Change – Road Traffic Noise- Short Term

Short term magnitude	Short term noise change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 1.0
Minor (Slight)	1.0 to 2.9
Moderate	3.0 to 4.9
Major (Substantial/Severe)	Greater than or equal to 5.0
Negligible	Less than 1.0

Table 6.4 - Magnitude of Change – Road Traffic Noise- Long Term

Long term magnitude	Long term noise change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 3.0
Minor (Slight)	3.0 to 4.9
Moderate	5.0 to 9.9

Major (Substantial/Severe)	Greater than or equal to 10.0
Negligible	Less than 3.0

6.3.31 The impact magnitude categories can then be correlated with the receptor sensitivity categories in Table 6.7 to establish a level of effect as defined in Table 6.8.

6.3.32 In order to assess the likelihood of any impact upon existing residential properties from **on-site** traffic and mobile plant noise, noise calculations have been undertaken using BS5228: 2009+A1:2014 'haul road' methodology and traffic flow information. The use of CRTN methodology is used for the impact of 'off-site' road traffic.

Level and Significance of Effect

6.3.33 The level of an effect is a function of the sensitivity or importance of the receiver, or receptor, and the scale or magnitude of the effect. In the case of this assessment the level of the effect has been determined by reference to existing guidance and standards that are explained below.

6.3.34 Two types of receptor have been identified:

- Residents of existing and proposed houses adjacent to the Site who could experience site operational noise during the daytime.
- Residents of existing houses who could experience additional road noise from the Proposed Development

Operational Noise

6.3.35 For general site operations we would refer to PPG for noise limits as they are the most relevant and appropriate for the type of activity i.e.

"Mineral planning authorities should aim to establish a noise limit, through a planning condition, at the noise-sensitive property that does not exceed the background noise level (LA90,1h) by more than 10dB(A) during normal working hours (0700-1900). Where it will be difficult not to exceed the background level by more than 10dB(A) without imposing unreasonable burdens on the mineral operator, the limit set should be as near that level as practicable. In any event, the total noise from the operations should not exceed 55dB(A) L_{Aeq,1h} (free field)."



- 6.3.36 For temporary operations such as soil-stripping, the construction and removal of baffle mounds, soil storage mounds and spoil heaps, construction of new permanent landforms, restoration work and aspects of site road construction and maintenance a noise limit of up to 70dB $L_{Aeq,1h}$ (free field) for periods of up to 8 weeks in a year would be applicable.

Assessment of Significance

- 6.3.37 The two principal criteria to predict the significance of potential noise impacts are:
- magnitude of the impact; and
 - sensitivity of the receptors
- 6.3.38 This assessment combines the above criteria to predict the significance of the noise and impacts of the Proposed Development. This assessment combines the PPG criteria to predict the significance of the noise impacts of the Proposed Development.
- 6.3.39 To help understand the effects of noise changes, descriptions of subjective response have been added. Table 6.5 below shows the proposed impact magnitude scale.

Table 6.5 - Impact Magnitude Scale - Future Noise against Existing (Operational Phase) in accordance with PPG criteria

Site noise relative to background noise (BG) & absolute limits dB(A) in accordance with PPG criteria	Subjective Response	Impact Magnitude
<10dB(A) above BG and ≤55dB(A) $L_{eq,1hr}$	Complaint unlikely	Negligible
≥10dB(A) above BG and ≤55dB(A) $L_{eq,1hr}$	Complaint unlikely	Slight
≤10dB(A) above BG and >55dB(A) $L_{eq,1hr}$	Marginal	Moderate
>10dB(A) above BG and >55dB(A) $L_{eq,1hr}$	Complaint likely	Substantial to Severe

- 6.3.40 The criteria in Table 6.5 reflect key benchmarks of human response to changes in noise level and absolute noise limits, which are deemed to be reasonable. Achieving a limit of background +10dB(A) is the guidance aim with an absolute noise level limit at or below 55dB(A) which is deemed to be acceptable in accordance with PPG and is therefore not significant. Exceeding background +10dB(A) and exceeding 55dB(A) $L_{eq,1hr}$ would represent a significant impact.
- 6.3.41 The impact magnitude scale in Table 6.6 is used in the assessment of operational noise. The impact scale in relation to restoration and maintenance (e.g. construction



of earth screening mounds, soil stripping and removal of mounds) activity noise is slightly different due to a temporary noise source and therefore the magnitude of impact is different. Table 6.6 below shows the impact scale used to assess temporary noise activities.

Table 6.6 - Impact Magnitude Category – Temporary Noise Activities (i.e. restoration, soil stripping and movement for construction of earth mounds)

Change in Noise Level dB(A)	Subjective Response	Impact Magnitude
Up to 70dB(A) L_{eq1hr} for up to 8 weeks, operational phase noise <10dB(A) ¹ and <55dB(A) L_{eq1hr}	Audible, complaint unlikely for short term activity	No significant impact (negligible)
Up to 70dB(A) L_{eq1hr} for up to 8 weeks, operational phase noise =>10dB(A) ¹ and <=55dB(A) L_{eq1hr}	Audible, potential for complaint depending on period of activity	Slight
Up to 70dB(A) L_{eq1hr} for up to 8 weeks, operational phase noise <=10dB(A) ¹ and >55dB(A) L_{eq1hr}	Annoying, complaint possible	Moderate
Up to 70dB(A) L_{eq1hr} for up to 8 weeks, operational phase noise >10dB(A) ¹ and >55dB(A) L_{eq1hr}	Annoying, complaint likely	Substantial to Severe

¹This refers to the site operational phase noise level relative to and above typical background noise at NSR.

6.3.42 To assess the likely impact on NSR from noise due to increased traffic on the local road network associated with the Proposed Development, noise calculations have been undertaken using CRTN methodology and traffic flow information for the Rainham Site.

6.3.43 The DMRB LA 111 provides guidance on the magnitude of change in terms of road traffic noise. The procedure for assessing noise impacts advises the use of a LA_{10} measurement index based on a daytime 18-hour time period (i.e. 0600 to 2400 hours) and night-time period (i.e. 0000-0600 hours). Further assessment of the impact would be required where changes of 1dB(A) or more are expected in the short-term and changes of 3dB(A) in the long term.

Road Traffic Noise

6.3.44 DMRB LA 111 defines the short term and long-term scenarios which are considered to represent the situation when a new road opens (short term) and 15 years after a



road opens (long term). The magnitude of change criteria is set out in Table 6.7 for the short term and 6.8 for the long term.

Table 6.7 - Magnitude of Change – Road Traffic Noise- Short Term

Short term magnitude	Short term noise change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 1.0
Minor (Slight)	1.0 to 2.9
Moderate	3.0 to 4.9
Major (Substantial/Severe)	Greater than or equal to 5.0

Table 6.8 - Magnitude of Change – Road Traffic Noise- Long Term

Long term magnitude	Long term noise change (dB $L_{A10,18hr}$ or L_{night})
Negligible	Less than 3.0
Minor (Slight)	3.0 to 4.9
Moderate	5.0 to 9.9
Major (Substantial/Severe)	Greater than or equal to 10.0

6.3.45 In order to determine the significance of an impact, not only must the magnitude of this impact be determined but also the sensitivity of the receptors to the impact. For this assessment, the categories presented in Table 6.9 have been adopted.

Table 6.9 - Receptor Sensitivity

Receptor Sensitivity	Type of Receptor
High	Dwellings/residential properties including houses, flats, old people's homes, hospitals, schools, churches, caravans and open spaces/conservation areas.
Moderate	Commercial premises including retails and offices etc.
Low	Industrial premises including warehouses and distribution etc.

6.3.46 Based upon the assessment of impact magnitude and the sensitivity of individual receptors, the matrix shown in Table 6.10 has been developed in order to provide an indication of the possible level of effect for each predicted noise impact. Given that there are many factors which may affect the level of the effect of an impact, not least, the character of the noise and timescales over which the noise operates, the overall level of effect must be assessed on an individual basis using professional judgement and experience. Therefore, whilst the matrix provides a useful indication of the likely significance it cannot be applied in all situations.



Table 6.10 - Level of Effect Matrix

Impact Magnitude	Receptor Sensitivity		
	High	Moderate	Low
Severe	Major	Major/Moderate	Moderate/Minor
Substantial	Major/Moderate	Moderate	Minor
Moderate	Moderate	Moderate/Minor	Minor/Neutral
Slight	Minor	Minor/Neutral	Neutral
No significant impact (negligible)	Neutral	Neutral	Neutral

- 6.3.47 Where a level of effect is defined as Major or Major/Moderate then the effect is likely to be considered significant i.e. an impact that is likely to be a key material factor in the decision-making process.

Limitations

- 6.3.48 No specific limitations were encountered in the preparation of this assessment chapter.

6.4 Baseline

- 6.4.1 An environmental daytime baseline sound survey was carried out in August 2022 for the planning submission relating to the retention and extension to the Materials Recycling Facility (“MRF”) and Plastics Recycling Facility (“PRF”) at the Rainham Site. Monitoring was carried out in the vicinity of NSR boundaries to the south of the River Thames (i.e. Wharfside Close, Erith at circa 900m). This provides data on existing ambient and background noise levels at NSR adjacent to the site for comparison and establishing relevant noise limits. The NSR to the north of the Landfill Site is circa 1.4km and is within 200m of the A13 and therefore we do not consider this to require further baseline monitoring (i.e. background levels highly likely to exceed 45dB L_{A90} and the maximum limit of 55dB $L_{Aeq,1hr}$ would apply).
- 6.4.2 Sound pressure levels were taken at a spot roaming position monitoring on land adjacent to nearest property boundaries to establish typical background sound data during a Friday daytime through to Sunday period. The survey was carried out during a morning and afternoon weekday and Saturday period at Wharfside Close, Erith on Friday 19th to Saturday 20th August 2022 by Mr D. R. Kettlewell of Noise & Vibration Consultants Ltd.

6.4.3 Measurements of background sound were recorded at the monitoring position shown on Figure 1. Data logging of L_{Aeq} , L_{A10} , L_{A90} and L_{Amax} were recorded over 15-minute intervals.

6.4.4 The background sound levels have been analysed for the monitoring period to establish the 'representative' background sound level.

6.4.5 The monitoring positions were as follows:

Position A (Wharfside Close) – South of Site

6.4.6 Monitoring position 'A' is representative of the NSR to the south of Site, which are located off Wharfside Close. Noise levels at this location are generally affected by local and distant road traffic noise. Noise from the landfill was not audible at this location. The monitoring position was chosen adjacent to (Receptor R1). Refer to Figure 6.1 for location.

6.4.7 Although ambient noise levels can vary depending on weather conditions, the purpose of the baseline survey is to monitor sound levels under suitable weather conditions. This then provides a typical and representative indication of ambient conditions.

6.4.8 For the purpose of this assessment, it is assumed that the assessment of operational noise from the Proposed Development would be undertaken under appropriate weather conditions and therefore any significant positive or negative vector from wind direction is not representative. The effect of wind speed and direction can also increase background noise levels thereby masking any potential increase in site-specific noise levels. For this reason, it is assumed that typical weather conditions apply and no increase or decrease for the wind vector is required.

6.4.9 It is considered that the results are a good indication of typical background sound levels as the survey included the closest residential NSR to the Site. Receptors at greater distance, would be subject to a lower level of impact due to a greater separation distance.

Existing Background Sound Survey Results



- 6.4.10 The results of measurements taken at the fixed monitoring position are presented in Table 6.11 and detailed measurements are provided in Appendix 6.3.

Table 6.11 - Existing Background Sound Levels at Monitoring Position (Weekday)

Monitoring Position	Time Period	LAeq dB	LA10 dB	LA90 dB	LAmx dB	Representative LA90 dB
A) Wharfside Close	Friday Morning (0700-1100)	50	52	46	56-71	46
A) Wharfside Close	Friday Afternoon (1510-1610)	53	56	45	68-72	45
A) Wharfside Close	Saturday Morning (0735-0835)	51	54	45	68-71	45

- 6.4.11 The results of background sound measurements taken at the monitoring position indicate that representative background sound levels during the weekday and Saturday daytime periods varied between 45dB and 46dB LA90.
- 6.4.12 Details of the instrumentation used for the survey are detailed in Appendix 6.2.
- 6.4.13 The local sound environment is therefore generally formed by noise from local and distant road traffic and birdsong. At the time of the survey noise levels from the landfill Site were not subjectively audible at the monitoring position.
- 6.4.14 The noise limit according to PPG for Mineral Workings would be 55dB LAeq,1hr or background +10dB whichever is the lower. The measured background sound level indicates that the limit is therefore 55dB LAeq,1hr at the noise sensitive receptor (NSR) boundary.

Identification of Nearest Sensitive Receptors (NSR)

Residential Receptors

- 6.4.15 The site is remote from residential NSR with the closest being the properties in Erith on the southern side of the River Thames, approximately 1km from the Site. These NSR are generally adjacent to industrial and retail land uses and the A2016 Bronze Age Way road. Whilst there are other receptors to the east and north of the A13 in Rainham these are at a much greater distance and therefore the impact would be lower than at Erith and unlikely to be audible.



- 6.4.16 We are not aware of any other future receptors proposed that would be of greater sensitivity than those considered in this assessment.

Ecological Receptors

- 6.4.17 The land area to the north and east of the landfill site constitutes the Inner Thames Marshes Site of Special Scientific Interest (SSSI) and RSPB reserve designated for its importance for birds.

- 6.4.18 The noise criteria adopted for the 2012 Landfill ES Noise Chapter made reference to the 'Environment Agency Avian Disturbance Review'. The Noise Chapter stated the following:

"13.5.12 The following table comes from research contained in the 'Environment Agency Avian Disturbance Review'. This provides an indication of where mitigation may be required and the level of noise that is likely to elicit a flight response from birds. This guidance is particularly relevant to the SSSI area to the north of The Site, which is designated for its importance for birds.

13.5.13 The table above contains a range of noise levels with the noise source at various distances from the receptors (in this case, birds). Taking the lowest of the suggested noise levels represents as a conservative approach the lowest suggested noise level where mitigation should be considered is 65 dB(A). Similarly, the lowest level at which "a flight response is almost certain" is 86 dB(A). This guidance does not clearly state which noise parameter the levels refer to. Therefore, to provide a conservative approach the predicted L_{Amax} levels have been used in this assessment."

6.5 Assessment of Effects

- 6.5.1 The measure that is generally used in noise assessments and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or L_{Aeq} parameter.
- 6.5.2 In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of which are:



- The sound power levels (SWL's) of the plant or equipment used on site.
- The frequency content and characteristics of the noise source.
- The periods of operation of the plant on site.
- The distance between the source noise and the receiving position.
- The presence or absence of screening effects due to barriers, or ground absorption.
- Any reflection effects due to the facades of buildings etc.

6.5.3 The calculation method used in this study is based upon BS5228-1:2009+A1:2014 noise propagation model, which takes into account source position, frequency content, screening effects, distance and direction in relation to the nearest receptor. For site operational noise we have used CadnaA software for producing noise maps of the highest likely generated noise. The assessment has used empirical field data taken from similar sites to calculate the expected resultant noise contribution at the nearest property boundary locations during daytime operations. The noise model provides predicted noise levels at each of the receptor points listed in sections 6.2.66 to 6.2.71.

6.5.4 An assessment has been undertaken on the following:

- operational activities including waste disposal works;
- restoration activities; and
- composting activities.

6.5.5 The site activities would involve the use of the following plant and machinery:

- Road Tipper HGVs
- Compactor
- 360 Excavator
- Front Loader
- Dozer
- Dump Truck
- Water Bowser

- 6.5.6 The above noise sources and their associated activities would vary from day to day and would be in use at different stages of the Proposed Development and for varying durations. The prediction calculations allow for the cumulative effect of all plant in operation and maximum HGVs movements to represent the highest likely noise levels.
- 6.5.7 The assessment of infill, restoration and composting activities is based on plant detailed in 6.5.5 above and empirical data on plant noise levels from library data as outlined in Appendix 6.4.
- 6.5.8 In order to give an indication of the highest likely noise levels generated by the works, the noise sources are considered at the closest approach. The procedures set out in British Standard, BS5228-1:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites', have been used to estimate noise levels at the nearest receptor properties.
- 6.5.9 The unit used to assess construction noise is the Equivalent Continuous Sound Pressure Level, L_{Aeq} .

Waste Disposal, Restoration & Composting

- 6.5.10 Waste disposal and restoration material will be imported to the Site over the proposed extended period for waste disposal and restoration. The proposed phasing and restoration plans are illustrated on Figures 3.2 and 3.5.
- 6.5.11 This would include using the plant detail provided in paragraph 6.5.5 above.
- 6.5.12 It is anticipated that waste material would be transported to the Site via Tipper HGVs and positioned and compacted using a Compactor and Dozer. Based on the data provided within the Transport Assessment there would be an average of 172 two-way HGVs per weekday.
- 6.5.13 Empirical field data obtained from measurements of associated infill, restoration and composting plant at similar sites in the UK have been used to calculate the expected resultant noise contribution at the nearest property boundary locations during daytime operations. Refer to Table 6.12 and Appendix 6.4 for further information.



6.5.14 The following table provides an indication of the highest likely noise levels during the waste disposal, restoration and composting activities. This excludes any proposed mitigation measures as detailed in section 6.6. Refer to Appendix 5 for the noise map.

Table 6.12 - Predicted highest likely noise contribution from waste disposal, restoration and composting site operations at NSR

Receptor	Phase	Noise contribution from Site Operations LAeq1hr dB	Proposed Noise Criteria in accordance with PPG guidance LAeq1hr dB	Noise level difference between PPG noise criteria & site noise LAeq1hr dB
R1: Wharfside Close	2024-2029 ¹ 2024-2031 ²	35-41 35-41	55 55	-20 to -14 -20 to -14
R2: Chichester Close	2024-2029 ¹ 2024-2031 ²	37-41 37-41	55 55	-18 to -14 -18 to -14
R3: Eastwood Drive	2024-2029 ¹ 2024-2031 ²	39 39	55 55	-16 -16
R4: Werrington Road	2024-2029 ¹ 2024-2031 ²	40-41 40-41	55 55	-15 to -14 -15 to -14

¹Landfill waste disposal operations. ²Restoration operations (all predictions include the composting operations)

6.5.15 The assessment of impact from waste disposal, restoration and composting Site activities concludes that at all NSR there would be a **negligible** impact magnitude and **neutral** effect during peak periods of activity and as such these impacts are not considered significant in EIA terms. Paragraphs 6.6.1-6.6.2 provide mitigation measures applying BPM.

Ecological and Recreational Receptors

6.5.16 Table 6.13 provides noise predictions from the Proposed Development at ecological sensitive land areas and recreational receptors around the London Outer Orbital Path (LOOP).

Table 6.13 - Predicted highest likely noise contribution from waste disposal, restoration and composting site operations at ecological and recreational NSR

Receptor Position	Period	Predicted Sound Pressure Levels LAeq1hr dB	Lowest level where mitigation should be considered LAeq1hr dB	Predicted LMax Levels dB	Maximum EA flight response level LMax dB
E1. SSSI	Daytime	53-55	65	64-66 ¹	86
REC1. LOOP	Daytime	40-59	65	51-70 ²	-

¹The predicted noise levels are due to the proximity of Coldharbour Lane road traffic, which forms the access road into site. ²The LOOP varies in distance from the access road and peak levels.

- 6.5.17 The above results show no significant noise generation likely to occur at the sensitive ecological receptor or the recreational receptor. The proximity of the LOOP relative to the access road into Site towards the southern section of the path results in short-term peak L_{Amax} levels from HGV movements being higher than the majority of the route around the Site. The L_{Aeq} and L_{Amax} levels are however not shown to be significant and in consideration of this receptor being transient, any temporary noise is deemed to be a **slight** impact and **minor** effect and **not significant**. Noise mitigation measures are proposed for the landfill operation and management to minimise noise at NSR, refer to section 1.6.

Commercial Receptors

- 6.5.18 The Freightmaster re-development project, which is located adjacent to the southwestern corner of the Landfill Site has outline planning approval for B1, B2 & B8 Class use development (planning ref. P2438.21). Any associated offices of the development are indicated to be generally located on the southern or eastern sides of the buildings.
- 6.5.19 The predicted levels at the nearest potential offices of these facilities (i.e. on northern side of the building units) are indicated to result in predicted noise levels from the Landfill activities at the closest approach between 40dB to 56dB $L_{Aeq,1hr}$ (which is a pessimistic view of noise levels). This is within BS8233:2014 guidance for office environments (external level of circa 55-60dB L_{Aeq} with an open window) and therefore not significant.

Road Traffic Noise

- 6.5.20 The Site is located off the A13, via Ferry Lane and then Coldharbour Lane. The A13 connects the site with London and the surrounding regions. The Site is bordered to the north and east by Coldharbour Lane. To the south and east the Site is bounded by access roads and industrial units on the Freightmaster Estate, beyond which lies the River Thames.



6.5.21 The site access and internal circulation arrangements for HGVs would remain unchanged from the existing strategy. HGVs would access the site via the Coldharbour Lane from the A13 as described above. The access roads from the A13 to the Site does not pass any residential development that would be subject to any increase in road traffic noise.

6.5.22 According to the Transport Assessment at paragraphs 5.5.12 and 5.5.13:

“5.5.12 The results identify that the total vehicle percentage increases are only marginally above a 10% link impact threshold and suggest that the operation of the proposed development would not result in any material negative effects on either local or strategic highway network operational performance, particularly given that this percentage impact was assessed against a forecast baseline traffic flow which is lower than the existing observed flow along Coldharbour Lane. On this basis it is considered that the impact of the proposed development would be negligible.

5.5.13 The proposed development is therefore considered to be acceptable from a trip generation and traffic impact perspective. The HGV trips generated by the proposed development are already present on the local highway network, and continuation of landfill operations would not result in a material impact on the local highway network.”

6.5.23 Therefore, the change in noise levels as a result of the traffic associated with the Proposed Development would be **negligible** and as such represents a **neutral** significance on high sensitivity residential receptors. As such the impact is considered **not significant** in EIA terms.

6.6 Incorporated Mitigation

Operational Noise

6.6.1 In accordance with BS 5228, best practical means would be employed to control the noise generation. In consideration of applying best practical means, the following measures would be proposed:

- Restricting operations to the following operating hours:
Monday to Friday: 0700 hours and 1600 hours
Saturday: 0700 hours and 1200 hours
- Regular maintenance of plant; and

- Site management.

Site Management

6.6.2 The following measures would assist in minimising radiated noise from site:

- Maintain speed restriction on-site for HGVs by the use of traffic calming measures;
- All mobile plant operating on-site should be designed such that reverse alarm use is minimised.
- Where practicable, the mobile plant should be fitted with broadband noise type alarms (i.e. non 'beeper' type).
- Ensure drivers are instructed to minimise engine revving and avoid unnecessary impact noise.
- Use of modern equipment fitted with appropriate exhaust silencers.
- Engines to be switched off when not in use.
- Plant equipment should not have engine covers or hoods removed except for maintenance.
- Access and on-site roads regularly maintained and gradient minimised to avoid high engine revving (where practicable and avoiding noise created by, for example, lorries dropping into potholes and bouncing).
- Introduce a complaints procedure and/or site liaison contact or committee for local residents so that they can be informed of site progress and to enable them to be able to make contact with site.
- The use of modern 'quiet' equipment fitted with appropriate silencers etc.
- Effective planned maintenance in accordance with manufacturers' specifications to avoid the generation of excessive noise due to malfunction and to ensure any malfunction is rectified as soon as possible - repair records can be made available.
- Where possible, restoration materials stripped from previously restored areas will be formed into bunds between the working area and the direction of noise sensitive receptors to create temporary noise barriers.
- The limitation of simultaneous working of machinery where possible.
- During restoration activities, louder noise generating activities will be restricted

to the landfill operational working hours.

6.7 Cumulative Effects

- 6.7.1 The following describe the information available with respect to the consideration of cumulative effects in terms of noise, provide a summary of the likely noise contribution from the relevant developments to the NSR considered in this Chapter, and conclude on the potential for cumulative effects.
- 6.7.2 Planning application P0070.23 for the 'Continued operation, redevelopment and expansion of the existing Plastics Recycling/Recovery Facility, Materials Recycling Facility buildings with vehicle depot and associated landscaping and parking' includes a noise impact assessment provided by NVC Ltd (the author of this assessment) via report ref. R22.0901/DRK dated 27th September 2022.
- 6.7.3 The assessment of cumulative effects from the existing or proposed re-development of the PRF and MRF is provided below in Table 6.14. The landfill activities include the operation of the waste disposal, restoration and composting activities and HGV movement on Site.

Table 6.14 - Predicted Cumulative noise levels from waste disposal, restoration, composting and proposed site operations from the existing or proposed PRF and MRF development at NSR

Receptor	Phase	Noise contribution from Landfill Site Operations L _{Aeq,1hr} dB	Noise Contribution from Existing or Proposed MRF/PRF Operations L _{Aeq,1hr} dB	Cumulative Noise Level from Landfill & Existing or Proposed MRF/PRF Operations L _{Aeq,1hr} dB	Noise level difference between PPG [i.e. 55dB(A)] noise criteria & Cumulative Site noise L _{Aeq,1hr} dB
R1: Wharfside Close	2024-2029 ¹	35-41	35-36	38-42	-17 to -13
	2024-2031 ²	35-41	35-36	38-42	-17 to -13
R2: Chichester Close	2024-2029 ¹	37-41	28-34	38-42	-17 to -13
	2024-2031 ²	37-41	28-34	38-42	-17 to -13
R3: Eastwood Drive	2024-2029 ¹	39	34	40	-15
	2024-2031 ²	39	34	40	-15
R4: Werrington Road	2024-2029 ¹	40-41	35	41-42	-14 to -13
	2024-2031 ²	40-41	35	41-42	-14 to -13

- 6.7.4 The above table shows no significant cumulative increase in noise levels when considering the existing or proposed re-development of the PRF and MRF. The

assessment of impact concludes that at all NSR there would be a **negligible** impact magnitude and **neutral** effect during peak periods of activity and as such these impacts are not considered significant in EIA terms.

Ecological and Recreational Receptors

- 6.7.5 Table 6.15 provides cumulative noise predictions from the Proposed Development and cumulative effects from the existing or proposed re-development of the PRF and MRF at ecological sensitive land areas and recreational receptors around the London Outer Orbital Path (LOOP).

Table 6.15 - Predicted Cumulative noise levels from waste disposal, restoration, composting and proposed site operations from the existing or proposed PRF and MRF development at Ecological or Recreational Receptors

Receptor	Noise contribution from Proposed Development Operations L _{Aeq,1hr} dB [L _{Amax}]	Noise Contribution from Existing MRF/PRF Operations L _{Aeq,1hr} dB [L _{Amax}]	Noise Contribution from Proposed MRF/PRF Operations L _{Aeq,1hr} dB [L _{Amax}]	Cumulative Noise Level from Proposed Development & Existing or Proposed MRF/PRF Operations L _{Aeq,1hr} dB [L _{Amax}]	Maximum EA flight response level L _{Amax} dB
E1. SSSI	53-55 [64-66]	45 [48-60]	36 [39-51]	54-55 [64-66]	86
REC1. LOOP	40-59 [51-70]	36-56 [39-71]	29-54 [32-69]	41-62 [69-71]	86

- 6.7.6 The above results show no significant cumulative noise generation is likely to occur at the sensitive ecological receptor or the recreational receptor. The proximity of the LOOP relative to the access road into Site towards the southern section of the path results in short-term peak L_{Amax} levels from HGV movements being higher than much of the access route around the Site. The L_{Aeq} and L_{Amax} levels are however not shown to be significant and in consideration of the recreational receptor being transient, any temporary noise is not deemed to be significant. The assessment of impact concludes that there would be a **slight** impact magnitude and **minor** level of effect during peak periods of activity and as such these impacts are considered **not significant**.

- 6.7.7 Noise relating to the existing gas engine and leachate facilities are permitted under a separate planning consent and would continue to operate beyond the life of the



Proposed Development. The existing baseline levels would include the operation of these facilities and their contribution to the baseline would be very low at NSR due to their location on Site which provides circa 300m to 700m separation distance.

Future Baseline

6.7.8 The Site has been assessed against the current baseline which includes permitted noise sources in the area around the Proposed Development.

6.7.9 If the Proposed Development was not granted the baseline levels would not significantly change due to the influence of existing ambient noise from local noise sources.

6.8 Mitigation

6.8.1 There are no additional mitigation measures required in order to comply with relevant and appropriate noise guidance and standards for the operation phase.

6.9 Residual Effects and Conclusions

6.9.1 During the waste disposal, restoration and composting period of the development there would be a range of noise sources in use and noise levels would vary throughout the lifespan of the Proposed Development. The highest noise levels relative to NSR are likely to occur during Phase 2 in 2025 when plant is closest to the southwest corner of the Site.

6.9.2 The introduction of BPM mitigation measures (refer to sections 6.6.1 to 6.6.2) has the effect of minimising noise levels at the NSR.

6.9.3 It is concluded that the operational noise with the implementation of mitigation measures, using best practical means, is likely to result in an impact magnitude classification of **negligible** at receptors and a **neutral** level of effect.

6.9.4 The change in noise levels as a result of the traffic associated with the Proposed Development would be **negligible** and as such represents a **neutral** significance on high sensitivity residential receptors. As such the impact is considered **not significant** in EIA terms.



- 6.9.5 In terms of cumulative effects from other proposed or permitted developments on Site have been considered and the impact on residential NSR is likely to result in a **negligible** impact magnitude and a **neutral** level of effect and **not significant**.
- 6.9.6 In terms of the effect on ecological, recreational NSR, the results of analysis show a **slight** impact and **minor** level of effect and **not significant**.
- 6.9.7 In summary, **no significant noise effects** have been identified by the noise assessment in relation to the Proposed Development. Table 6.16 below summarises the predicted effects of the operational and restoration of the Proposed Development.

Table 6.16 - Residual Impact at Nearest Sensitive Receptor after Mitigation Measures

Source	Nature of Effect	Time Period	Potential Effect	Proposed Mitigation	Residual Effect	Residual Impact Magnitude
Operational Road Traffic noise	Direct & Temporary	Daytime	Neutral	None Required	Neutral	Negligible
Operational Noise ¹	Direct & Temporary	Daytime	Neutral	BPM Mitigation	Neutral	Negligible
Operational Noise ²	Direct & Temporary	Daytime	Neutral to Slight	BPM Mitigation	Neutral to Minor	Negligible to Slight
Cumulative Effects	Direct & Temporary	Daytime	Neutral	BPM Mitigation	Neutral	Negligible

¹Relative to residential receptors ²Relative to ecological and recreational receptors

Conclusions

- 6.9.8 Noise levels have been considered and assessed during the waste disposal, restoration and composting phases of the Proposed Development. Relevant and appropriate noise guidance and standards have been used to determine the impact. The assessment has been undertaken to establish the impacts of the Proposed Development, such that any likely noise impact on existing and potential NSR is within acceptable limits and no significant impacts are likely to occur.
- 6.9.9 To establish any likely impact from noise, an assessment of baseline sound levels has been considered by undertaking sound monitoring at the nearest residential receptor areas.



- 6.9.10 In accordance with appropriate standards, best practical means would be employed to control the noise generation during the operational period. Measures include, for example, restriction on operating hours, use of broadband type noise reversing alarms and management controls of plant maintenance and operation.
- 6.9.11 The effect of the Proposed Development on site has been considered and impacts presented in terms of the cumulative effect of any developments local to the Proposed Development from permitted or proposed development on Site.
- 6.9.12 The assessment shows that with appropriate mitigation measures there would be no significant impacts during the waste disposal, restoration and composting activities of the Proposed Development.

