PINS document reference 5.4.20.1

APPENDIX ES20.1

NOISE AND VIBRATION IMPACT ASSESSMENT

Noise and Vibration Impact Assessment

DCO Application for the Alteration and Construction of Hazardous Waste and Low Level Radioactive Waste Facilities, East Northants Resource Management Facility, Stamford Road, Northamptonshire

AUGEAN SOUTH LTD

R21.10201/2/1/AP
Date of Report: 27 July 2021
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REPORT DETAILS

Client	Augean South Ltd
Report Title	Noise and Vibration Impact Assessment – DCO Application for the Alteration and Construction of Hazardous Waste and Low Level Radioactive Waste Facilities
Site Address	East Northants Resource Management Facility, Stamford Road, Northamptonshire
Report Ref.	R21.10201/2/1/AP
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QUALITY ASSURANCE

Issue No.	Issue Date	Author	Technical Review
1	27/07/21	[redacted]	
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EXECUTIVE SUMMARY

1. Augean South Ltd is the operator of the East Northants Resource Management Facility and has commissioned Vibrock Ltd to undertake a noise and vibration impact assessment as part of an application for a Development Consent Order (DCO).

2. The DCO is for an extension to the area and timescales for the operation of the site including an extension to the west of the existing site and increasing the throughput of the waste treatment and recovery facility.

3. The approach to the assessment was agreed with the local authority prior to commencement and has taken into consideration the responses provided during the consultation process.

4. Existing sound levels were measured at locations representing noise sensitive premises in the vicinity of the site and this information has been used to establish the baseline conditions.

5. Noise level predictions associated with the construction and operation of the proposed development have been calculated at nearby noise-sensitive premises. These worst-case predictions are based on information regarding the proposed working of the site and have been undertaken following calculation methods that are suitable for open sites such as landfill facilities.

6. The development has been assessed with reference to national and local noise policy and guidance along with other technical guidance suitable for the assessment of noise and vibration from waste sites.

7. The outcome of the assessment indicates that the proposed scheme is not likely to result in any significant or unacceptable adverse effects. A range of noise and vibration control measures have been identified and will be included in the site Noise and Vibration Management Plan which forms part of the DCO Environmental Commitments.

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1.0 INTRODUCTION

1.1 Overview

1.1.1 Augean South Ltd is the operator of the East Northants Resource Management Facility (ENRMF) and is submitting an application for a Development Consent Order (DCO) for an extension to the area and timescales for the operation of the site including an extension to the west of the existing site and increasing the throughput of the waste treatment and recovery facility. Vibrock Limited was commissioned to undertake a noise and vibration impact assessment of the proposals.

1.1.2 This study benefits from an inspection and sound level monitoring undertaken at the existing site in July 2020 and background noise monitoring undertaken in February 2021. An assessment of the potential impact of noise emissions from the facility has been made with reference to national and local noise policy along with relevant technical guidance.

1.1.3 Further explanation of the terminology used within this report is provided in Section 8 of this document.

1.2 Current Situation

1.2.1 The existing ENRMF site lies approximately 1.7 km east south east of Duddington village and approximately 2.6 km north of Kings Cliffe village in the East Northamptonshire district of Northamptonshire. The existing highway access to the ENRMF site is from Stamford Road which is a minor road that runs adjacent to the eastern boundary of the site from the A47 to the north. The site formerly was known as Slipe Clay Pit and has a long history of mineral and waste development.

1.2.2 The existing ENRMF site comprises an active hazardous waste and low level radioactive waste (LLW) landfill site including completed and partially restored landfill areas together with a waste treatment and recovery facility. Current operations are the subject of Environmental Permits issued and regulated by the Environment Agency.

1.2.3 The operating hours of the site are as follows and will not change as part of the application:

Monday to Friday	0700 – 1800
Saturday	0700 – 1300

1.2.4 Noise emissions from the site are currently controlled via a Noise Management and Monitoring Scheme[1].

1.2.5 There are scattered properties within 1km of the application area. The closest properties to the application area are Westhay Cottages located approximately 25m to the east of the application boundary. Westhay Farm is located approximately 75m east of the application boundary and is operated as a haulage yard and a farm with associated agricultural and commercial buildings. Westhay Lodge is located approximately 615m to the south of the application boundary and Cuckoo Lodge lies approximately 875m to the north of the application boundary adjacent to the A47. The closest settlement to the site is Duddington the outskirts of which are located approximately 1.1km to the west north west of the boundary of the northern section of the western extension area.

1.2.6 Collyweston and Kings Cliffe are located approximately 1.6km and 2km from the application boundary respectively, however, these locations have not been included within the noise assessment as they are too distant from the application site.

[1] MJCA Report Ref: AU/KCE/SPS/1604/01 dated March 2012

1.3 Proposed Development

1.3.1 The application boundary covers an area of approximately 58.6 hectares and includes the existing ENRMF site. The existing ENRMF site is approximately 31.8 hectares and the proposed western extension covers an area of approximately 26.8 hectares. A site location plan is provided in Figure 1.

1.3.2 The proposal includes the construction of new landfill void to the west of the currently consented hazardous waste and low level radioactive waste landfill area and the alteration of the restoration profile and the timescale for completion of the existing landfill site in order to integrate the final landscape of the existing site with the western extension.

1.3.3 The application includes an increase in the consented throughput of waste to the waste treatment and recovery facility and an increase in the total waste input rate to the site from 250,000 tpa to 300,000 tpa. The proposed development will lead to an increase of 36 HGV movements per day which equates to an average hourly increase of 4 vehicle movements per hour.

1.3.4 In order to construct the western extension void it will be necessary to win and work minerals including the extraction of soils, overburden and clay. The soils and some clay will be retained on site for use in site restoration and the construction of the low permeability engineered liner and capping layers. The remaining materials will be exported off site.

1.3.5 The application includes the alteration of the operational period of the current site activities and the western extension to December 2046.

1.4 Consultation

1.4.1 The approach to the noise assessment was discussed with an Environmental Health Officer at the former East Northamptonshire District Council. The former Northamptonshire County Council and the Environment Agency have also had the opportunity to review the assessment approach and provide comment.

1.4.2 Full details of this initial consultation are presented in Appendix 1. In summary, the proposed assessment methodology was considered to be acceptable with all responses also highlighting the need to consider any potential uncertainties associated with establishing the baseline conditions at a time when acoustic environments may be affected by the COVID-19 pandemic.

1.4.3 The Inspectorate's comments provided within the Scoping Opinion have also been taken in to account within this report. The comments highlighted the need for the assessment to include consideration of the following:

- The representativeness of the baseline conditions (discussed in section 3);
- Operational noise and vibration from increased HGV movements (discussed in section 4.5);
- Construction phase impacts (discussed in section 4.7);
- Potential impacts at night (discussed in section 4.1);
- Assumptions and limitations (discussed in section 2.4);
- Cross-referencing (discussed in section 4.4);
- Mitigation measures including the submission of a management plan (discussed in section 5).

2.0 METHODOLOGY

2.1 INTRODUCTION

2.1.1 This section describes how noise and vibration emissions associated with the proposed development have been established and outlines the policy and guidance against which the impact assessment has been conducted.

2.2 NOISE POLICY AND GUIDANCE

2.2.1 National Planning Policy and Guidance

Noise Policy Statement for England (NPSE)

2.2.1.1 The NPSE[2] sets out the Government's policy on noise and includes the long term vision of promoting good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.2.1.2 This long term vision is supported by the following 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

[2] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

- where possible, contribute to the improvement of health and quality of life.

2.2.1.3 There are two established 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.

2.2.1.4 Extending these concepts further, NPSE[3] 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.

2.2.1.5 NPSE acknowledges that it is not possible to have a single objective noise-based measure that defines NOEL, LOAEL and SOAEL that is applicable to all sources of noise in all situations. It is therefore suggested that more specific advice from other applicable noise standards and guidance could be employed to determine suitable noise level criteria within the overall principles of the NPSE.

[3] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

National Planning Policy Framework (NPPF)

2.2.1.6 The NPPF[4] was first published on 27 March 2012 and updated on 24 July 2018, 19 February 2019 and 20 July 2021. This sets out the government's planning policies for England and how these are expected to be applied.

2.2.1.7 Where issues of noise impact are concerned the NPPF provides brief guidance in Chapter 15 '*Conserving and enhancing the natural environment*' as follows:

Paragraph 174:

Planning policies and decisions should contribute to and enhance the natural and local environment by 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.

Paragraph 185:

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;

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

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; and

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

Paragraph 187:

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.

2.2.1.8 Specifically in relation to mineral sites, the NPPF[5] provides guidance in Chapter 17 '*Facilitating the sustainable use of minerals*' as follows:

Paragraph 209:

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.

[5] Chapter 17: National Planning Policy Framework – Ministry of Housing, Communities and Local Government. July 2021.

Paragraph 210:

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 extraction; 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.

Paragraph 211:

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;

d) not grant planning permission for peat extraction from new or extended sites;

e) provide for restoration and aftercare at the earliest opportunity, to be carried out to high environmental standards, through the application of appropriate conditions. Bonds or other financial guarantees to underpin planning conditions should only be sought in exceptional circumstances;

f) consider how to meet any demand for small-scale extraction of building stone at, or close to, relic quarries needed for the repair of heritage assets, taking account of the need to protect designated sites; and

g) recognise the small-scale nature and impact of building and roofing stone quarries, and the need for a flexible approach to the duration of planning permissions reflecting the intermittent or low rate of working at many sites.

Planning Practice Guidance (PPG)

2.2.1.9 PPG is written in support of the NPPF[6] and provides an increased level of specific planning guidance.

2.2.1.10 PPG-Noise[7] states that noise needs to be considered when development may create additional noise, or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced).

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

2.2.1.11 PPG-Noise[8] states that *plan-making and decision taking need to take account of the acoustic environment and in doing so consider:*

- *whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur;*
  and
- *whether or not a good standard of amenity can be achieved.*

2.2.1.12 In line with the Explanatory note of the NPSE[9] this would include identifying whether the overall effect of the noise exposure would be above or below the significant observed adverse effect level (SOAEL) and the lowest observed adverse effect level (LOAEL) for the given situation.

2.2.1.13 When noise is not perceived to be present, there is by definition no effect. As the noise exposure increases, it will cross the 'No Observed Effect Level'. However, the noise has no adverse effect so long as the exposure does not cause any change in behaviour, attitude or other physiological responses of those affected by it.

2.2.1.14 As the exposure increases further, it crosses the LOAEL boundary above which the noise starts to cause small changes in behaviour and attitude and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise).

[7] Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019. Paragraph: 001 Reference ID: 30-001-20190722
[8] Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019. Paragraph: 003 Reference ID: 30-003-20190722
[9] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.

2.2.1.15 Increasing noise exposure will at some point cause the SOAEL boundary to be crossed. Above this level the noise causes a material change in behaviour. If the exposure is predicted to be above this level the planning process should be used to avoid, but not necessarily prevent, this effect occurring, for example through use of appropriate mitigation such as by altering the design and layout.

2.2.1.16 Table 1 summarises the noise exposure hierarchy from PPG-Noise[10].

2.2.1.17 In terms of identifying areas of tranquillity, PPG-Noise[11] states the following:

"For an area to justify being protected for its tranquillity, it is likely to be relatively undisturbed by noise from human sources that undermine the intrinsic character of the area. It may, for example, provide a sense of peace and quiet or a positive soundscape where natural sounds such as birdsong or flowing water are more prominent than background noise, e.g. from transport.

Consideration may be given to how existing areas of tranquillity could be further enhanced through specific improvements in soundscape, landscape design (e.g. through the provision of green infrastructure) and/or access."

[10] Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.
[11] Planning Practice Guidance – Noise. Paragraph: 008 Reference ID: 30-008-20190722

Response	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other 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			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for 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, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Table 1. Noise Exposure Hierarchy (PPG-Noise)[12]

[12] Planning Practice Guidance – Noise. Paragraph: 005 Reference ID: 30-005-20190722

2.2.1.18 The supporting 'Minerals' PPG[13] is the current Government advice applicable to the control of noise from surface mineral workings in England and recognises that planning for the supply of minerals has a number of special characteristics that are not present in other development.

2.2.1.19 The minerals guidance is relevant to this assessment as, although the ENRMF is predominantly a landfill and treatment operation, the construction of the void within the western extension area will require the winning and working of minerals including the extraction of soils, overburden and clay. This guidance is also relevant as it is widely recognised that waste disposal sites share many common features with surface mineral working.

2.2.1.20 The Minerals PPG includes the following appropriate noise standards 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 ($L_{A90,1h}$) 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).

For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h}$ (free field).

[13] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.

For any operations during the period 2200 – 0700 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) $L_{Aeq,1h}$ (free field) at a noise sensitive property.*[14]

2.2.1.21 The same document includes instances where particularly noisy short-term activities may occur and the *appropriate* criteria for such circumstances:

"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) $L_{Aeq,1h}$ (free field) for periods of up to eight 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 eight 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) $L_{Aeq,1h}$ (free field) limit referred to above should be regarded as the normal maximum".*[15]

2.2.1.22 The suitability of each proposed mineral site, whether an extension to an existing site or a new site, must be considered on its individual merits but thought should also be given to the cumulative impact of proposals in an area.

[14] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014. Paragraph: 021 Reference ID: 27-021-20140306
[15] Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014. Paragraph: 022 Reference ID: 27-022-20140306

National Policy Statement for Waste

2.2.1.23 This National Policy Statement[16] sets out detailed waste planning policies. Noise and Vibration is addressed in Appendix B as follows:

"In testing the suitability of sites and areas in the preparation of Local Plans and in determining planning applications, waste planning authorities should consider the factors below. They should also bear in mind the envisaged waste management facility in terms of type and scale…

… j. noise, light and vibration
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."

National Policy Statement for Hazardous Waste

2.2.1.24 This National Policy Statement[17] sets out Government policy for hazardous waste developments which comprise Nationally Significant Infrastructure Projects. Noise and Vibration is addressed in Section 5.11 and paragraph 5.11.10 states the following:

"The Secretary of State should not grant development consent unless it is satisfied that the proposals will meet the following aims:

16 National Policy Statement for Waste. October 2014. Department for Communities and Local Government.
17 National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure. June 2013. DEFRA

- *avoid significant adverse impacts on health and quality of life from noise as a result of new development;*
- *mitigate and minimise other adverse impacts on health and quality of life from noise from new development, including through the use of requirements; and*
- *where possible, contribute to improvements to health and quality of life through the effective management and control of noise."*

2.2.2 Local Planning Policy

Northamptonshire Minerals and Waste Local Plan

2.2.2.1 The Local Plan[18] is the land use planning strategy for minerals and waste related development in the county. It provides the basis for investment in new minerals and waste development in Northamptonshire, and where in the county it should go to. The adopted Local Plan provides the basis for determining planning applications for, or covering, minerals and waste related development in Northamptonshire.

2.2.2.2 Policy 18, shown below, is relevant to this impact assessment.

Addressing the impact of proposed minerals and waste development Proposals for minerals and waste development must demonstrate that the following matters have been considered and addressed:

- *protecting Northamptonshire's natural resources and key environmental designations (including heritage assets),*

[18] Northamptonshire County Council Minerals and Waste Local Plan 2017.

- *avoiding and / or minimising potentially adverse impacts to an acceptable level, specifically addressing air emissions (including dust), odour, bioaerosols, noise and vibration, slope stability, vermin and pests, birdstrike, litter, land use conflict and cumulative impact,*
- *impacts on flood risk as well as the flow and quantity of surface and groundwater,*
- *ensuring built development is of a design and layout that has regard to its visual appearance in the context of the defining characteristics of the local area,*
- *ensuring access is sustainable, safe and environmentally acceptable, and ensuring that local amenity is protected.*

Where applicable a site-specific management plan should be developed to ensure the implementation and maintenance of mitigation measures throughout construction, operation, decommissioning and restoration works.

North Northamptonshire Joint Core Strategy 2011 – 2031 (Adopted July 2016)

2.2.2.3 The North Northamptonshire Joint Core Strategy[19] is the strategic Part 1 Local Plan for Corby, East Northamptonshire, Kettering and Wellingborough. It outlines a big picture to be developed in more detail through the Part 2 Local Plans prepared by the District and Borough Councils and by Neighbourhood Plans prepared by Neighbourhood Planning Groups.

2.2.2.4 Policies 3 and 8, outlined below, are relevant to this impact assessment.

[19] North Northamptonshire Joint Core Strategy 2011 – 2031. July 2016. North Northamptonshire Joint Planning Unit.

POLICY 3 – LANDSCAPE CHARACTER

Development should be located and designed in a way that is sensitive to its landscape setting, retaining and, where possible, enhancing the distinctive qualities of the landscape character area which it would affect.

Development should:

a) Conserve and, where possible, enhance the character and qualities of the local landscape through appropriate design and management;

b) Make provision for the retention and, where possible, enhancement of features of landscape importance;

c) Safeguard and, where possible, enhance important views and vistas including sky lines within the development layout;

d) Protect the landscape setting and contribute to maintaining the individual and distinct character, and separate identities of settlements by preventing coalescence;

e) Provide appropriate landscape mitigation and/or suitable off-site enhancements; and

f) Preserve tranquillity within the King's Cliffe Hills and Valleys Landscape Character Area (as shown on the Policy Map) and other areas identified in Part 2 Local Plans by minimising light and noise pollution and minimising the visual and traffic impacts of development.

POLICY 8 – NORTH NORTHAMPTONSHIRE PLACE SHAPING PRINCIPLES

Development should:

...e) Ensure quality of life and safer and healthier communities by:

i. Protecting amenity by not resulting in an unacceptable impact on the amenities of future occupiers, neighbouring properties or the wider area, by

reason of noise, vibration, smell, light or other pollution, loss of light or overlooking;

ii. Preventing both new and existing development from contributing to or being adversely affected by unacceptable levels of soil, air, light, water or noise pollution or land instability.

Northamptonshire Minerals and Waste Development Framework: Development and Implementation Principles SPD (Adopted September 2011)

2.2.2.5 The Northamptonshire Minerals and Waste Development Framework[20] is the land use planning strategy for minerals and waste related development in the county. Box SPD3: 'Design principles for minerals and waste development states' the following:

"Proposals for development must incorporate the following principles:

…Environmental protection and enhancement – All design aspects (built form, site layout, lighting, access, landscaping, etc) should seek to avoid and where necessary mitigate adverse impacts on the surrounding environment and human health (including air, water, land, noise, odour, amenity, landscape, biodiversity, heritage assets, geodiversity, and flood risk) whilst maximising beneficial outcomes.

[20] Northamptonshire Minerals and Waste Development Framework. Development and Implementation Principles Supplementary Planning Document. September 2011. Northamptonshire County Council.

2.2.3 Technical Guidance

BS 4142:2014+A1:2019

2.2.3.1 British Standard 4142[21] describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

1) sound from industrial and manufacturing processes;
2) sound from fixed installations which comprise mechanical and electrical plant and equipment;
3) sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
4) sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

2.2.3.2 The methods described in this British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

2.2.3.3 This standard is intended to be used for the purposes of:

a) investigating complaints;
b) assessing sound from existing, proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

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

c) assessing sound at proposed new dwellings or premises used for residential purposes.

2.2.3.4 This standard is not intended to be applied for the following purposes:

- The determination of noise amounting to a nuisance;
- The assessment of indoor sound levels;
- The assessment of low-frequency noise;
- The assessment of sound from the passage of vehicles on public roads and railway systems;
- The assessment of sound from recreational activities, including all forms of motorsport;
- music and other entertainment;
- shooting grounds;
- construction and demolition;
- domestic animals;
- people;
- public address systems for speech;
- The assessment of sound from other sources falling within the scopes of other standards or guidance.

2.2.3.5 The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. When making assessments and arriving at decisions it is essential to place the sound in context.

2.2.3.6 The sound level from a source when determined as a discrete entity, distinct and free of other influences contributing to the ambient sound, is referred to as the ‘specific sound level’.

2.2.3.7 The specific sound level is evaluated, at an identified assessment location, over the appropriate reference time interval which is as follows:

- 1 hour during the daytime (07:00 – 23:00); and
- 15 minutes during the night-time (23:00 – 07:00).

NB. The shorter reference time interval at night means that short duration sounds with an on time of less than 1 hour can lead to a greater specific sound level when determined over the reference time interval during the night than when determined during the day.

2.2.3.8 The specific noise may be subject to an acoustic character correction if the noise level at the assessment location is subjectively considered to exhibit certain acoustic features that could increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where such features are present at the assessment location, add a character correction to the specific sound level to obtain the rating level.

2.2.3.9 This standard requires the assessor to consider the subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which such acoustically distinguishing characteristics will attract attention. Such features are taken into account by applying the corrections, summarised in Table 2, to the specific sound level to obtain the rating level.

Subjective Prominence	Tonality	Impulsivity	Intermittency	Other Sound Characteristic (neither tonal, nor impulsive, nor intermittent)
Just Perceptible	+2 dB	+3 dB	-	-
Clearly Perceptible	+4 dB	+6 dB	-	-
Highly Perceptible	+6 dB	+9 dB	-	-
Readily Distinctive Against Residual Environment	-	-	+3 dB	+3 dB

Table 2. Summary of BS 4142 Acoustic feature corrections based on subjective prominence

2.2.3.10 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically. However, if any single feature is dominant to the exclusion of the others then it might be appropriate to apply a reduced or even zero correction for the minor characteristics. The rating level is equal to the specific sound level if there are no such features present or expected to be present.

2.2.3.11 An initial estimate of the impact of the specific sound is obtained by subtracting the measured background sound level from the rating level, and consider the following:

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 or more 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.

2.2.3.12 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.

2) The character and level of the residual sound compared to the character and level of the specific sound.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

   i) façade insulation treatment;

   ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

   iii) acoustic screening.

2.2.3.13 Response to sound can be subjective and is affected by many factors both acoustic and non-acoustic. The significance of its impact, for example, can depend on such factors as the margin by which a sound exceeds the background sound level, its absolute level, time of day and change in the acoustic environment, as well as local attitudes to the source of the sound and the character of the neighbourhood.

Horizontal Guidance Note IPPC H3 (part 2) Noise Assessment and Control (withdrawn and replaced on 23 July 2021)

2.2.3.14 IPPC H3 (part 2) guidance[22] was produced by the Environment Agency for England and Wales in collaboration with the Scottish Environment Protection Agency and the Northern Ireland Environment and Heritage Service.

2.2.3.15 Integrated Pollution Prevention and Control (IPPC) was a regulatory system that employed an integrated approach to control the environmental impacts of certain industrial activities such as waste facilities. IPPC was superseded by Environmental Permitting Regulation principles in England but the H3 guidance still applied up to July 2021.

2.2.3.16 H3 Part 2 described the principles of noise measurement and prediction and the control of noise by design, by operational and management techniques and abatement technologies. Section 2.3.3 Part 2 referenced BS 4142 as a method of evaluating noise from industrial activities.

2.2.3.17 Section 2.3.3.7 of the H3 guidance highlighted that waste disposal sites may share many common features with surface mineral working, and suggested that Operators and planning authorities may therefore also wish to take account of the planning practice guidance relating to noise

[22] Integrated Pollution Prevention and Control (IPPC) Horizontal Guidance for Noise Part 2 – Noise Assessment and Control. Environment Agency. v3 June 2004.

emissions from mineral sites when considering applications relating to waste sites such as the ENRMF.

Noise and Vibration Management: Environmental Permits

2.2.3.18 This guidance replaces the Environment Agency Horizontal Guidance for Noise (H3) parts 1 and 2, which have been withdrawn.

2.2.3.19 The Environment Agency, Scottish Environment Protection Agency, Natural Resources Wales and Northern Ireland Environment Agency have produced this guidance[23] to help holders and potential holders of permits apply for, vary, and comply with their permits.

2.2.3.20 This guidance covers:

- how the environment agencies will assess noise from certain industrial processes;
- what the law says you must do to manage noise and vibration;
- advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan.

2.2.3.21 This guidance outlines best practice and emphasises that noise assessments should be carried out by competent personnel and, in line with H3 guidance, also promotes the use of the guidance provided within BS 4142.

[23] Integrated Pollution Prevention and Control (IPPC) Horizontal Guidance for Noise Part 2 – Noise Assessment and Control. Environment Agency. v3 June 2004.

World Health Organisation (WHO)

2.2.3.22 The WHO Guidelines for Community Noise[24] aims to provide environmental health authorities and professionals with guidance on the adverse health effects of community noise on people. This document presents a summary of research and opinions on the impacts of noise and recommends guideline values for avoidance of particular effects e.g. annoyance and sleep disturbance.

2.2.3.23 The following guideline values have been derived according to specific environments. The values relevant to this assessment are shown in Table 3.

Specific Environment	Critical Health Effect(s)	L_{Aeq} (dB)	Time base (hrs)
Outdoor living area	Serious annoyance, daytime and evening	55	16
	Moderate annoyance, daytime and evening	50	16
Dwelling, indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16
Inside bedrooms	Sleep disturbance, night-time	30	8

Table 3: Guideline values for community noise in specific environments.

[24] *Guidelines for Community Noise*. World Health Organization (WHO) 1999.

Calculation of Road Traffic Noise (CRTN)

2.2.3.24 CRTN[25], issued by the Department of Transport and Welsh Office, describes the procedures for calculating noise from road traffic.

2.2.3.25 The calculation method uses a number of input variables including traffic flow volume, average vehicle speed and percentage of heavy goods vehicles, to predict the noise level for any receptor point at a given distance from the road.

2.2.3.26 All noise levels are expressed in terms of the index L_{10} hourly or L_{10} (18-hour) dB(A). The value of L_{10} hourly dB(A) is the noise level exceeded for just 10% of the time over a period of one hour. The L_{10}(18 -hour) dB(A) is the arithmetic average of the values of L_{10} hourly dB(A) for each of the eighteen one-hour periods between 0600 to 2400 hours.

Design Manual for Roads and Bridges (DMRB) – LA 111 Noise and Vibration

2.2.3.27 DMRB LA 111[26] sets out the requirements for assessing and reporting the effects of highways noise and vibration from construction, operation and maintenance projects.

2.2.3.28 LA 111 outlines a method for determining traffic noise level changes via a comparison of calculated Basic Noise Levels (BNL). BNL calculations are undertaken by using traffic flow, speed and HGV percentage to calculate a reference noise emission from a road link as set out in CRTN. Once this comparative analysis has been undertaken the magnitude of change shall be defined in accordance with LA 111 as shown in Tables 4 and 5 below.

[25] Calculation of Road Traffic Noise (CRTN) Department of Transport / Welsh Office. 1988.
[26] Design Manual for Road and Bridges. Sustainability and Environment. LA111 Noise and Vibration Revision 2. Highways England May 2020.

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

Table 4. LA111 Magnitude of change – short term

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

Table 5. LA111 Magnitude of change – long term

2.2.3.29 LA111 suggest that road traffic noise level changes of 1 dB in the short-term and 3 dB in the long-term are considered to be negligible and therefore not significant.

2.2.3.30 In general terms, a change in noise level of +1 dB is equivalent to a 25% increase in traffic flow and a change of +3 dB is equivalent to a 100% increase in traffic flow[27] assuming other factors, such as vehicle speed, remain unchanged.

2.2.3.31 Operational vibration is scoped out of the LA 111 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.

[27] Annex 1 of Design Manual for Road and Bridges. Vol.11 Section 3 Part 7. HD213/11 Noise and Vibration. The Highways Agency, November 2011 [NB. LA111 supersedes HD213/11 which is withdrawn].

BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise

2.2.3.32 BS 5228-1[28] provides guidance on the prediction, measurement, assessment and control of noise generated from construction sites.

2.2.3.33 Whilst this guidance is considered relevant to this assessment, it should be noted that the construction phase is not considered as a separate stage to the operation of the development in this assessment as the operations of extraction, construction of the engineered void, landfilling, construction of the engineered cap and restoration are sequential and take place concurrently in different phases of the site as the development proceeds.

2.2.3.34 Annex E.3.2 of BS 5228-1 refers to an assessment approach known as the 'ABC method'. This method is adopted to identify whether the level of construction noise impacting neighbouring residents is significant based on the existing ambient noise level.

2.2.3.35 Primarily, the ABC Method requires the ambient noise level for the appropriate period (daytime, evening/weekends or night-time) to be measured and rounded to the nearest 5 dB. From this the relevant Category (A, B or C) can then be determined as shown in Table 6 below.

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

Assessment category and threshold value period	Threshold value, in decibels (dB) ($L_{Aeq,T}$)		
	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 potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

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.

Table 6. Threshold of potential significant effect at dwellings

2.2.3.36 To perform an assessment the category threshold value is then compared with the site noise level. If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated.

2.2.3.37 The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect.

BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration

2.2.3.38 This part of BS 5228[29] gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/operations generate significant vibration levels. Guidance is provided concerning methods of measuring vibration and assessing its effects on the environment.

2.2.3.39 In terms of the human response to vibration the threshold of perception is typically in the PPV range of 0.14 mms^{-1} to 0.3 mms^{-1}. As vibrations increase above these values they can disturb, startle, cause annoyance or interfere with work activities. At higher levels they can be described as unpleasant or even painful. Guidance on the effects of vibration levels is reproduced in Table 7 below.

Vibration Level (PPV)	Effect
0.14 mms^{-1}	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mms^{-1}	Vibration might be just perceptible in residential environments.
1.0 mms^{-1}	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.
10 mms^{-1}	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

Table 7. Guidance on effects of vibration levels

[29] BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Vibration. British Standards Institution 2014.

BS 6472-1:2008 Guide to Evaluation of Human Exposure to Vibration in Buildings

2.2.3.40 BS 6472-1[30] provides general guidance on human exposure to building vibration in the range of 0.5 Hz to 80 Hz. The standard gives Vibration Dose Value (VDV) for the basis of assessment.

2.2.3.41 Human reaction to vibration depends on displacement, frequency, the duration (exposure time), point of application and direction of the vibration. The units in which VDV are measured are metres per second raised to the power of minus 1.75 (or $ms^{-1.75}$).

2.2.3.42 BS 6472-1 gives VDV ranges which might result in various probabilities of adverse comment by those who experience the vibration within residential buildings as shown in Table 8.

Location	Low Probability of adverse comment ($ms^{-1.75}$) [1]	Adverse comment possible ($ms^{-1.75}$)	Adverse comment probable ($ms^{-1.75}$) [2]
Residential Buildings (16 hour Day 07:00 – 23:00)	0.2 to 0.4	0.4 to 0.8	0.8 to 1.6
Residential Buildings (8 hour Night 23:00 – 07:00)	0.1 to 0.2	0.2 to 0.4	0.4 to 0.8

[1] *Below these ranges adverse comment is not expected*
[2] *Above these ranges adverse comment is very likely*

Table 8. VDV ranges which might result in various probabilities of adverse comment within residential buildings

30 BS 6472-1 Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than Blasting. British Standards Institution 2008.

BS 7385-2: 1993 Evaluation and Measurement for Vibration in Buildings

2.2.3.43 BS 7385-2[31] provides guidance on the assessment of the possibility of vibration-induced damage in buildings due to a variety of sources.

2.2.3.44 It gives guidance on the levels of both transient and continuous ground borne vibration above which building structures could be damaged.

2.2.3.45 Only the direct effect of vibration on buildings is considered. The indirect effects on the building structure due to ground movement, the movement of loose objects within buildings, the possibility of damage to sensitive equipment and the effect of vibration on people are outside the scope of this standard.

2.2.3.46 Limits for transient vibration, above which 'cosmetic' damage to residential buildings could occur are given numerically in Table 9.

Type of Building	Peak component particle velocity in frequency range of predominant pulse *	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light Framed structures Residential or light Commercial type buildings	15 mm/s at 4 Hz Increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz Increasing to 50 mm/s at 40 Hz and above
* *Values referred to are at the base of the building*		

Table 9. Transient vibration guide values for cosmetic damage

2.2.3.47 Minor damage is possible at vibration magnitudes which are greater than twice those given in the table, and major damage to a building structure may occur at values greater than four times the tabulated values.

[31] BS 7385-2 Evaluation and measurement for vibration in buildings - Part 2: Guide to damage levels from groundborne vibration. British Standards Institution 1993.

2.3 NOISE AND VIBRATION SOURCES

2.3.1 A site inspection and an acoustic survey of the existing site were performed on 16 July 2020 during which the site was operating normally. The purpose of this monitoring was to obtain site specific sample measurements for use within this assessment to estimate noise from the proposed development.

2.3.2 The main noise and vibration generating activities observed during the survey include:

- The placement of materials in the void and into stockpiles;
- The loading and unloading of materials by mobile plant such as tele-handlers, excavators and loading shovels;
- HGV and dumptruck movements;
- The operation of the waste treatment and recovery facility;
- Engineering works including cell construction and capping.

2.3.3 Monitoring was undertaken using a Norsonic 140 Type 1 Precision Sound Analyser (Serial No. 1403165). During all measurements the microphone was protected with an outdoor windshield and the following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: Manual (various according to activity)

2.3.4 Weather conditions during the survey were dry and settled with average wind speed in the region of 2 ms^{-1}.and predominantly from a westerly direction. Cloud cover varied between 2 – 5 oktas and temperatures ranged from 16 – 20°C.

2.3.5 Site activities occurring during the on-site sample measurements were considered to be representative of typical operating conditions and the measurement durations were considered to be representative of any longer term fluctuations in the specific sound. The influence of sound from other sources was minimised by measuring at times when the residual sound had subsided to a relatively low level.

2.3.6 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a Norsonic 1251 Acoustic Calibrator (Serial No. 34488). No significant drift in the calibration value was observed between the initial and final checks.

2.3.7 The findings of the survey are presented in Table 10. Sample measurements of the sound pressure level obtained at known distances from plant and activities at the site have been used to calculate the sound power level of each noise source or noise-generating activity at the site with reference to the method outlined within BS 5228-1[32]. The noise sources are ranked from highest to lowest.

Source	Measured Sound Pressure Level dB(A)	Calculated Sound Power Level dB(A)
Mobile crusher/screen	L_{Aeq} 81.2 at 10m	109.2
Excavator loading dumptruck	L_{Aeq} 72.1 at 20m	106.1
Dozer (Engineering)	L_{Aeq} 83.6 at 5m	105.6
Tanker Compressor	L_{Aeq} 82.1 at 5m	104.0
Dozer (Restoration)	L_{Aeq} 75.9 at 10m	103.9

[32] Annex C. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise. BSI 2014.

Source	Measured Sound Pressure Level dB(A)	Calculated Sound Power Level dB(A)
360 Excavator loading HGV	L_{Aeq} 76.0 at 10m	103.8
Loading Ash Hopper with telehandler	L_{Aeq} 75.1 at 10m	103.0
Dumptruck (movements)	L_{Amax} 74.9 at 10m	102.9
Soil Plant (Waste Treatment Facility)	L_{Aeq} 73.3 at 10m	101.3
Loading Shovel Loading Dumptruck	L_{Aeq} 73.4 at 10m	101.1
Placement of materials	L_{Aeq} 72.2 at 10m	100.3
Road Lorry (movements)	L_{Amax} 71.0 at 10m	99.0
Telehandler (Unloading)	L_{Aeq} 70.2 at 10m	98.2
Dust Suppression Unit (Cannon)	L_{Aeq} 70.3 at 10m	98.2
Generator	L_{Aeq} 76.1 at 5m	98.1
Leachate Pump	L_{Aeq} 72.7 at 5m	94.9
HGV manoeuvring on weighbridge	L_{Aeq} 66.3 at 10m	94.3
Plant 4 (Waste Treatment Facility)	L_{Aeq} 71.7 at 5m	93.7
Wheelwash	L_{Aeq} 70.5 at 5m	92.6
Wheelwash Pump	L_{Aeq} 74.5 at 3m	91.8
Wheelwash Generator	L_{Aeq} 68.3 at 5m	90.5
Laboratory Ventilation Plant	L_{Aeq} 65.3 at 4m	85.5
HGV idling on weighbridge	L_{Aeq} 62.0 at 5m	84.0

Table 10. Calculated sound power levels based on measurements of plant and activities at the existing ENRMF site (July 2020).

2.4 NOISE LEVEL PREDICTIONS

2.4.1 Introduction

2.4.1.1 The level of noise in the local environs that arises from a site will depend on several factors. The more significant of which are:

- the sound level output of the plant or equipment used on site;
- the periods of operation of the plant on site;
- the distance between the source noise and the receiving position;
- the presence of screening due to barriers;
- the reflection of sound;
- soft ground attenuation.

2.4.1.2 Noise levels associated with the proposed development have been calculated at the identified noise-sensitive receptor locations based on the following methodologies and assumptions.

2.4.2 Calculation Methodology

2.4.2.1 In order to assist in the calculation of noise levels from the proposed development, CadnaA noise modelling software has been used. The prediction method used is that outlined within Annex F of BS 5228-1[33]. This guidance details methods to estimate noise from 'open sites' which can include quarries, waste sites and long-term construction projects.

2.4.2.2 The most important elements of this standard used to estimate site noise within this assessment include the sound level of plant/activities, distance attenuation, activity on-time, screening effects, ground absorption and angle of view corrections.

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

2.4.2.3 Screening has been calculated in accordance with Figure F.3 of BS 5228-1 which allows for the attenuation of a barrier or topographical feature to be calculated in octave bands by examining the path difference created by the screen as well as the frequency of the sound. The level of attenuation provided by any screening has been calculated in octave bands from 63 Hz to 8 kHz using spectra obtained via measurement of plant and activities at the existing ENRMF site.

2.4.2.4 For all noise prediction calculations, the ground absorption coefficient has been estimated according to the combination of soft and hard ground conditions present between the source and receiver position. 'Soft' ground is taken to refer to surfaces which are absorbent to sound, e.g. grassland, cultivated land or plantations as opposed to 'hard' ground surfaces which reflect sound such as paving, asphalt and surface water.

2.4.2.5 The attenuation from screening and soft ground attenuation have not been combined (where applicable). Instead, either the attenuation from screening and hard ground propagation, or the attenuation provided by soft ground alone has been included in the calculation, whichever is the greater of the two.

2.4.2.6 Predictions have been made to locations representing private external amenity areas at a height of 1.5 metres above ground level and at least 3.5 metres from any reflecting surface other than the ground. Night-time noise levels have been predicted at a height of 4 metres above ground level to represent bedroom windows of two-storey dwellings. The predictions made are 'free-field' sound levels to allow for an appropriate comparison with the free-field background sound levels measured during the survey.

2.4.2.7 The convention applied throughout this report, is that all measured or calculated numbers are rounded to the nearest whole number with 0.5 being rounded up.

2.4.2.8 All noise level predictions have been calculated with the combinations of mobile plant working at the closest point of the application site to the receptor location. The calculations are therefore worst case scenarios which may be of relatively short duration or which may never take place with the full combination of activities at the same time at that location. The following worst-case scenarios, summarised in Table 11, have been considered during the calculation of noise levels from the proposed development according to each assessment location.

Receptor	Worst case stage of operations in terms of potential for noise impacts
Westhay Cottages and Westhay Farm	Construction of Phase 14, Landfilling of Phase 13, Capping/Restoration of Phase 5. Continuation of the waste treatment and recovery facility.
Westhay Lodge	Construction of Phase 17, Landfilling of Phase 16, Capping/Restoration of Phase 15. Continuation of the waste treatment and recovery facility.
Cuckoo Lodge	Construction of Phase 14, Landfilling of Phase 13, Capping/Restoration of Phase 12. Continuation of the waste treatment and recovery facility.
Duddington Village	Construction of Phase 14, Landfilling of Phase 13, Capping/Restoration of Phase 12. Continuation of the waste treatment and recovery facility.

Table 11. Noise modelling scenarios

2.4.2.9 As a result the calculations indicate the potential highest $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst-case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less.

2.4.3 Noise Model Inputs

2.4.3.1 Tables 12 – 16 detail the inputs used within the noise modelling software.

Parameter	Input
Software	DataKustik GmbH CadnaA version 2021
Calculation Standards/Guidelines	BS 5228
Model of Terrain	Triangulation
Max. Order of Reflection	2
Ground Absorption	$G = 0.9$
Ground Absorption (hardstanding areas on the site)	$G = 0.1$
Max. Search Radius (m)	5000.00
Max. Error (dB)	0.1
Grid Height (m)	Daytime 1.5 (relative) Night-time 4.0 (relative)
Off-site buildings	Not included
Contours (site)	Detailed Topo Survey
Contours (off site)	0.5 metre intervals

Table 12. Noise model configuration

Description	X (m)	Y (m)	Z (m AOD)
Westhay Cottages	501270.3	300038.7	85.5
Westhay Farm	501339.4	299902.9	84.5
Westhay Lodge	501386.7	299127.1	71.5
Cuckoo Lodge	500331.5	301702.9	92.2
Duddington Village	499071.3	300830.3	58.2

Table 13. Noise-sensitive premises location details

Description	X (m)	Y (m)	Z (m AOD)
Gas Abstraction Plant	500476.35	300164.49	84.5
Waste Treatment Plant	500563.93	300101.79	87.3
Generator (Waste Treatment Pad Security Lighting)	500561.40	300123.98	83.9
Wheelwash	501131.68	299807.28	86.0
Weighbridge	501228.73	299891.77	85.5
Laboratory Ventilation	501262.12	299841.47	85.5

Table 14. Static Noise Source Location Details

Plant/Activity	Sound Power Level dB(A)	Activity 'on-time'	Height Above Ground (m)	Data Source
Lab Ventilation	85.5	100%	2.5	Measurement
HGV manoeuvring on weighbridge	94.3	5%	1.5	Measurement
HGV idling (weighbridge)	84.0	50%	1.5	Measurement
HGV idling (laboratory)	84.0	25%	1.5	Measurement
Wheelwash Generator	90.5	100%	1.5	Measurement
Wheelwash Pump	91.8	10%	1.5	Measurement
Wheelwash	92.6	10%	2.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement
Leachate Pump	94.9	100%	1.0	Measurement

Plant/Activity	Sound Power Level dB(A)	Activity 'on-time'	Height Above Ground (m)	Data Source
Leachate Pump	94.9	100%	1.0	Measurement
Gas Abstraction Plant	98.0	100%	3.0	Previous NIA
Plant 4	93.7	50%	2.5	Measurement
Tanker Compressor	104.0	50%	2.0	Measurement
Soil Plant	101.3	100%	2.5	Measurement
Loading Ash Hopper With telehandler	103.0	25%	2.5	Measurement
Mobile Crusher/Screen	109.2	100%	2.0	Measurement
Road Lorry (movements)	99.0	24/hr 10 mph	1.5	Measurement
Loading Shovel	101.1	25%	2.5	Measurement
360 Excavator Loading HGV	103.8	25%	2.5	Measurement
Dumptruck (Processing)	102.9	24/hr 10 mph	2.0	Measurement
Telehandler (Ash)	98.2	25%	2.0	Measurement
Telehandler (Lab)	98.2	25%	2.0	Measurement
Telehandler (Cell)	98.2	25%	2.0	Measurement
Placement of materials	100.3	10%	2.0	Measurement
Dust Suppression Unit	98.2	100%	1.0	Measurement
Dumptruck (Engineering)	102.9	100/hr 10 mph	2.0	Measurement
Excavator (Engineering)	106.1	75%	2.5	Measurement

Plant/Activity	Sound Power Level dB(A)	Activity 'on-time'	Height Above Ground (m)	Data Source
Excavator (Engineering)	106.1	75%	2.5	Measurement
Excavator (Mineral)	106.1	25%	2.5	Measurement
Dozer (Engineering)	105.6	50%	2.0	Measurement
Dozer (Restoration)	103.9	25%	1.5	Measurement
Generators (Pad + Contractor)	98.1	100%	1.5	Measurement

Table 15. Noise source calculation inputs

Plant/Activity	Octave band sound power levels (dB)							
	63	125	250	500	1k	2k	4k	8k
Laboratory Ventilation Plant	83	82	84	85	81	75	69	60
HGV manoeuvring on weighbridge	97	95	88	89	91	88	81	74
HGV idling on weighbridge	96	85	75	77	79	78	75	68
Wheelwash Generator	93	98	95	87	82	80	73	66
Wheelwash Pump	87	90	87	90	88	84	71	56
Wheelwash	98	95	94	88	89	84	78	70
Leachate Pump	102	104	94	91	86	85	82	89
Gas Compound	91	91	91	91	91	91	91	91
Plant 4	103	101	98	90	87	81	75	69
Tanker Compressor	101	96	92	96	100	100	90	81

Plant/Activity	Octave band sound power levels (dB)							
	63	125	250	500	1k	2k	4k	8k
Soil Plant	108	102	98	100	97	93	87	84
Loading Ash Hopper With telehandler	96	97	93	94	97	98	96	89
Mobile Crusher/Screen	107	107	105	106	105	102	97	90
Road Lorry (movements)	107	100	99	95	95	91	85	77
Loading Shovel Loading Dumptruck	106	106	100	94	97	94	85	79
360 Excavator loading HGV	103	106	103	100	99	95	94	87
Telehandler	102	101	98	96	93	89	85	85
Placement of materials	97	100	100	95	96	93	88	81
Dust Suppression Unit	106	104	101	96	91	88	83	78
Dumptruck (movements)	101	104	105	95	99	95	89	80
Excavator loading dumptruck	109	116	103	104	100	97	91	85
Dozer (Engineering)	100	108	107	104	101	94	88	84
Dozer (Restoration)	107	107	107	99	97	97	90	81
Generators (Pad + Contractor)	104	105	103	94	90	86	80	74

Table 16. Noise source octave band sound levels

2.4.4 Modelling Results

2.4.4.1 Table 17 summarises the noise level predictions for the proposed development at each assessment location and the baseline conditions are described in Section 3.

Assessment Location	Indicative Worst-Case Site Noise Level (Specific Sound Levels) dB(A)	
	Daytime 0700 – 1800	Night-time 2300 – 0700
Westhay Cottages	48	20
Westhay Farm	48	24
Westhay Lodge	38	23
Cuckoo Lodge	38	25
Duddington Village	30	19

Table 17. Noise level predictions for the proposed development

3.0 BASELINE

3.1 Introduction

3.1.1 Throughout much of 2020, the COVID-19 pandemic has presented challenges in obtaining representative baseline sound levels because typical road, air and rail transport usage have been reduced by travel restrictions and social distancing measures.

3.1.2 Background noise monitoring was undertaken by Vibrock Ltd in March 2011[34] as part of an application for a previous extension to the ENRMF site, and for the purposes of the Preliminary Environmental Information Report, the background noise data measured during the 2011 survey was temporarily adopted as a baseline against which to make an initial assessment of noise impact for the potential western extension.

3.1.3 Once the acoustic environment in the vicinity of the existing ENRMF site started to return to normal following the easing of lockdown restrictions, a new baseline noise survey was undertaken in 2021 in line with the approach agreed during consultation with the local authorities. The details of the survey are provided below.

3.2 Baseline Noise Survey Details

Survey Methodology

3.2.1 Noise levels were measured by Vibrock Ltd during a 24 hour period from 15th – 16th February 2021 at four locations selected to represent noise-sensitive premises in the vicinity of the site.

34 Vibrock report ref. R11.6219/5/LD Assessment of Environmental Noise. Westerly Extension of East Northants Resource Management Facility, Kings Cliffe, Northamptonshire. 8 September 2011.

3.2.2 Measurements were undertaken with reference to the guidance provided with BS 4142[35], BS 7445[36] and the ANC Environmental Noise Measurement Guide[37].

3.2.3 A plan showing the noise-sensitive receptor locations is provided in Figure 1.

Instrumentation

3.2.4 Monitoring was undertaken using the equipment detailed in Table 18.

Manufacturer	Type	Serial No.
Cirrus	Class 1 Integrating Sound Level Meter CR:171	G056448
	Class 1 Integrating Sound Level Meter CR:171	G300481
	Class 1 Integrating Sound Level Meter CR:171	G078475
	Class 1 Integrating Sound Level Meter CR:171	G078470
	Acoustic Calibrator CR:515	78061

Table 18. Noise Monitoring Instrumentation

3.2.5 During the survey the microphones were protected with suitable outdoor windshields.

3.2.6 The monitoring positions were 'free field' (no vertical reflective surfaces within 3.5 metres of the microphone) and at a height of between 1.2 – 1.5 metres above ground level.

[35] BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.
[36] BS 7445-1:2003 Description and measurement of environmental noise – Part 1 Guide to quantities and procedures. British Standards Institution 2003.
[37] ANC Guidelines: Environmental Noise Measurement Guide. 2013.

3.2.7 The following set-up parameters were used:

- Time Weighting: Fast
- Frequency Weighting: A
- Averaging-Integrating Period: 15 minutes
- Data Logging: Repeat (Contiguous)

3.2.8 With the equipment set up in the configuration used during measurement, field calibration checks were performed on site immediately before and after the survey period using a sound calibrator. No significant drift (i.e. no greater than ±0.5 dB) in the calibration value was observed between the initial and final checks.

Observations

3.2.9 Weather conditions during the survey were dry and settled with average wind speed considered to be around 3 ms^{-1} and typically from a south-westerly direction. Cloud cover varied between 5 – 8 oktas and temperatures ranged from 4 – 11°C.

3.2.10 The acoustic environment in Duddington Village and at Cuckoo Lodge consists primarily of road traffic noise associated with the A47 and A43. At Westhay Lodge, Westhay Cottages and Westhay Farm, the acoustic environment comprises distant road traffic, local vehicle movements along Stamford Road and birdsong along with occasional noise from aircraft, agricultural activity and operations at PC Howard Ltd and the existing ENRMF.

Results

3.2.11 Statistical analysis in line with the example approach presented in Section 8 (Fig. 4) of BS 4142[38] was performed on continuous 15 minute interval data to determine a representative background sound level at each assessment location during time periods that are relevant to this assessment. This analysis is presented in Figures 2 – 5.

3.2.12 After reviewing and analysing the noise data collected during the survey, the background sound levels for the purposes of this DCO application are summarised in Table 19.

Monitoring Location	Ambient Sound Levels $L_{Aeq,15mins}$ (dB)		Background Sound Levels $L_{A90,15mins}$ (dB)	
	Daytime (0700 – 1800)	Night-time (2300 – 0700)	Daytime (0700 – 1800)	Night-time (2300 – 0700)
Westhay Cottages and Farm	63	55	45	33
Westhay Lodge	52	42	36	28
Cuckoo Lodge	65	59	51	33
Duddington Village	60	55	49	36

Table 19. 2021 Baseline Noise Survey Summary Data

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

Measurement Uncertainty

3.2.13 The COVID-19 pandemic has presented challenges in obtaining representative background sound levels because typical road, air and rail transport usage have been reduced by travel restrictions and social distancing measures.

3.2.14 Department for Transport statistics on the use of transport during the COVID-19 pandemic reveals that motor vehicle usage during the survey period from 15 – 16 February 2021 was around 60% for cars, 82% for LGVs and 99% for HGVs when compared to pre-covid traffic flows. When all of the above vehicle types are combined, motor vehicle usage (comprising cars, LGVs and HGVs) was at 67% of pre-covid flows.

3.2.15 The DfT generate these vehicle usage percentages via comparison with the equivalent day in the first week of February 2020 and the analysis is based on data from around 275 automatic traffic count sites across Great Britain.

3.2.16 Reduced traffic flows of this magnitude are in theory expected to result in environmental noise levels that are lower than usual by around 1.7 dB at locations where the acoustic environment is influenced by traffic using the road network.

3.2.17 As a result the 2021 background noise levels presented within this report, whilst still being reasonably representative of the longer term prevailing acoustic environment, should be viewed as being on the conservative side. This is important to note, particularly when the data will be utilised within assessments that are based on a comparison against the background noise level such as the methodology presented within BS 4142[39] which is a key guidance document referenced within this report.

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

3.2.18 Notwithstanding the above, the measured background noise levels are generally higher than those measured during the previous survey in 2011 which is likely to be due to the increase in noise from transportation sources over this 10 year period.

3.2.19 Further comment in relation to uncertainty is provided later in the report as part of the BS 4142 assessment process.

3.3 Acoustic Environment on Public Rights of Way

3.3.1 To inform the assessment of the baseline noise environment on the public rights of way located closest to the site, observations were made along Footpaths MX13 and MX15 which pass through an area of woodland known as The Assarts to the west of the proposed extension area.

3.3.2 The nearest public right of way to the site, Footpath MX15, lies approximately 100 metres from the proposed western extension boundary at its closest approach and is understood to be located within King's Cliffe Hills and Valleys Landscape Character Area.

3.3.3 Observations were made at 3 locations to characterise the acoustic environment along these Public Rights of Way. The locations FP1 – 3 are shown on Figure 1 and the information collected is presented in Table 20.

Date and Time	Monitoring Location	Notes / Observations on the Acoustic Environment
15/02/21 14:00 – 15:30	FP1	*Collyweston Quarry operations audible* *Distant Road Traffic and Birdsong also contributing to the acoustic environment* *ENRMF Inaudible*
	FP2	*ENRMF operations audible* *Distant road traffic and birdsong also contributing to the acoustic environment*
	FP3	*Acoustic environment mainly comprises distant road traffic and birdsong* *ENRMF operations faintly audible on occasions*

Table 20. Observations of acoustic environment along nearest Public Rights of Way

3.4 Compliance Monitoring of Existing Noise Emissions

3.4.1 To further inform the DCO application, a compliance monitoring survey was conducted to assess existing noise emission levels from the ENRMF. The monitoring was undertaken in accordance with the current noise monitoring scheme for consented operations at the site (Report Ref: AU/KCE/SPS/1604/01 dated March 2012).

3.4.2 Noise level measurements were made during a 1 hour period from 15:20 to 16:20 on 16th February 2021 at a location representing the nearest noise-sensitive premises to the site, namely Westhay Cottages, as identified in the above monitoring scheme.

3.4.3 Measured noise levels during the survey were influenced by a variety of sound sources including road traffic and birdsong. Site activities at ENRMF and PC Howard Ltd (a distribution and warehousing company located off Stamford Road to the east of the ENRMF site) were also frequently audible. Vehicles travelling to and from these two sites also contributed to the measured noise levels.

3.4.4 The monitoring was fully attended which allowed the surveyor to make observations and record information regarding the noise-generating activities taking place during the measurements. These detailed notes were used post-survey to analyse the 1 second resolution time-history data for each consecutive 1 minute measurement period. Where necessary any significant contributions from noise sources unrelated to the ENRMF were excluded and the average 1 minute measurement revised to give a more accurate appraisal of noise from the ENRMF. Noise sources unrelated to the ENRMF typically included road traffic along Stamford Road and HGV movements associated with the nearby distribution and warehousing site operated by PC Howard Ltd. Where interference from other sources occurred for all or most of the 1 minute measurement interval, then this

data has been excluded completely from the calculation of the resultant one hour average noise level ($L_{Aeq,1h}$).

3.4.5 The measurement data at Westhay Cottages and the results of the post-survey analysis are presented in Table 21 below.

Start Time	Raw Data $L_{Aeq,1min}$ (dB)	Processed Data $L_{Aeq,1min}$ (dB)
15:20	45.3	45.3
15:21	67.3	61.5
15:22	46.3	46.3
15:23	64.1	50.2
15:24	69.8	-
15:25	71.0	62.0
15:26	61.6	48.0
15:27	70.8	-
15:28	62.0	47.7
15:29	61.6	53.4
15:30	66.7	-
15:31	72.9	-
15:32	49.5	49.5
15:33	68.1	47.6
15:34	63.8	53.1
15:35	62.8	46.6
15:36	68.3	-
15:37	69.2	-
15:38	71.5	-
15:39	67.0	53.9
15:40	65.9	50.7
15:41	66.5	49.0
15:42	66.0	48.3
15:43	66.1	47.9
15:44	62.7	49.2
15:45	62.3	51.0
15:46	63.2	47.7
15:47	49.5	49.5
15:48	69.7	49.7
15:49	49.3	49.3
15:50	66.1	47.1
15:51	46.7	46.7
15:52	51.4	51.4
15:53	51.4	51.4
15:54	50.5	50.5

Start Time	Raw Data $L_{Aeq,1min}$ (dB)	Processed Data $L_{Aeq,1min}$ (dB)
15:55	51.1	51.1
15:56	67.5	61.7
15:57	55.1	52.5
15:58	69.7	48.7
15:59	46.3	46.3
16:00	53.9	53.9
16:01	54.2	54.2
16:02	61.6	53.6
16:03	77.7	-
16:04	48.4	48.4
16:05	47.8	47.8
16:06	52.1	52.1
16:07	68.7	-
16:08	51.9	51.9
16:09	52.9	52.9
16:10	50.1	50.1
16:11	51.5	51.5
16:12	49.3	49.3
16:13	49.3	49.3
16:14	49.8	49.8
16:15	51.0	51.0
16:16	50.4	50.4
16:17	59.7	50.7
16:18	51.0	51.0
16:19	50.0	50.0
Resultant $L_{Aeq,1h}$	**66**	**53**

Table 21. Compliance Noise Survey Data at Westhay Cottages

3.4.6 The results of the compliance survey demonstrate that the noise level at the approved monitoring location was 53 dB $L_{Aeq,1h}$ which is within the limits specified by the existing noise monitoring scheme. In reality, noise levels resulting from activities associated with the existing ENRMF are likely to be lower than 53 dB due to the difficulties in excluding omnipresent sound sources such as distant road traffic and birdsong which were also considered to have some influence on the measured noise levels throughout the survey.

4.0 ASSESSMENT OF EFFECTS

4.1 BS 4142 Assessment

4.1.1 This standard requires the following levels to be established:

- The Background Sound Level
- The Specific Sound Level
- The Rating Level

Background Sound Level

4.1.2 BS 4142 requires the quantification of typical background sound levels at locations representing the noise-sensitive receptors. The results of the baseline survey are presented in Section 3.2 of this report.

Specific Sound Level

4.1.3 The specific sound level has been determined by calculation, based on measurement data presented in Section 2.3, using three-dimensional noise modelling software and the guidance within Section 7 of BS 4142 and Annex F of BS 5228[40]. The method of calculation and model inputs are detailed in Section 2.4 of this report.

4.1.4 A worst case scenario for each receptor location has been assessed based on the proposed phasing sequence for the site which demonstrates which noise-generating activities will be occurring concurrently at the existing site and across the proposed extension area and include construction, landfilling and restoration operations on the landfill and the continued

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

operation of the waste treatment and recovery plant. The assessment scenarios are outlined in Table 11.

Rating Level

4.1.5 In determining the Rating Level it is recognised that certain acoustic features can increase the significance of noise impact.

4.1.6 Whilst the noises sources under assessment produce occasional impulsive sounds and exhibit intermittency when observed in close proximity, these acoustic features are not considered to be discernible or readily distinctive against the residual acoustic environment at the assessment locations which are distant from the proposed extension area.

4.1.7 When current operations were observed from locations in the vicinity of Westhay Farm, Westhay Cottages and Westhay Lodge (the closest residential receptors to the site) during the recent site visit it was subjectively considered that there were no acoustically distinguishing characteristics that were significant enough to warrant the application of a correction. In terms of the proposed development it is not considered that this will exacerbate the prominence of any acoustic features or introduce any new acoustic features at the site.

4.1.8 Where there are no acoustic features expected to be present at the assessment locations the rating level is equal to the specific sound level.

Initial Estimate

4.1.9 Table 22 presents an 'initial estimate' of the potential impact of the proposals during the daytime in accordance with BS 4142[41].

Location	Daytime Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,1h}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Westhay Cottages	45	48	0	48	**+3**
Westhay Farm	45	48	0	48	**+3**
Westhay Lodge	36	38	0	38	**+2**
Cuckoo Lodge	51	38	0	38	**-13**
Duddington Village	49	30	0	30	**-19**

Table 22. Initial Estimate of Impact during the Daytime (BS 4142)

4.1.10 The above assessment demonstrates that the rating level is estimated to be up to 3 dB above the daytime background sound level depending on assessment location.

4.1.11 The highest noise levels of 48 dB, at Westhay Cottages and Farm, are influenced predominantly by restoration activities in Phase 5 located in the east of the current site and will therefore only occur for a relatively short period of time before these operations are finalised and progress to the west with the restoration of Phases 6 – 10.

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

4.1.12 The site will not be operational at night however it is understood that the gas abstraction plant along with a generator used for security lighting on the concrete pad associated with the waste treatment and recovery facility and a generator associated with the engineering contractor's compound could operate at night.

4.1.13 Potential night-time noise emissions have therefore also been assessed as shown in Table 23.

Location	Night-time Background Sound Level ($L_{A90,15min}$ dB)	Specific Sound Level ($L_{Aeq,15min}$ dB)	Acoustic Feature Correction (dB)	Rating Level ($L_{Ar,Tr}$ dB)	Initial Estimate Excess of rating over background sound level (dB)
Westhay Cottages	33	22	0	22	**-11**
Westhay Farm	33	26	0	26	**-7**
Westhay Lodge	28	24	0	24	**-4**
Cuckoo Lodge	33	26	0	26	**-7**
Duddington Village	36	20	0	20	**-16**

Table 23. Initial Estimate of Impact during the Night-time (BS 4142)

4.1.14 The above assessment demonstrates that the night-time rating levels are estimated to be at least 4 dB below the background sound level.

4.1.15 Typically, the greater the difference between the rating level and the background sound level, the greater the magnitude of the impact. BS 4142[42] states that where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact. A difference of around +5 dB is likely to be an indication of an adverse impact. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

4.1.16 It should be noted that the initial estimate is not to be considered in isolation and due regard to the following sections on context and uncertainty should also be made.

Context

4.1.17 In addition to the initial estimate of noise impact which has determined the excess of rating level over the background sound level, the following should also be considered as part of the impact assessment process:

- *Operational Period* – The most significant noise sources associated with the site operate during the daytime period only when there is a lower likelihood of adverse impact compared to operations during more sensitive periods such as the night-time;
- *Absolute Level of Sound* – The assessment has demonstrated that external noise levels in the region of 30 - 48 dB during the daytime and 20 – 26 dB during the night-time could be experienced at noise sensitive premises in the vicinity of the proposed development. This equates to internal sound levels of less than 35 dB during the daytime and 30 dB during the night-time with windows open and suggests (with reference to WHO Guidelines[43]) that there are

[42] Section 11. BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

[43] *Guidelines for Community Noise*. World Health Organization (WHO) 1999.

unlikely to be any significant adverse effects on residents within their homes or using private external amenity areas during the daytime;

- *Control Measures* – The site operates in accordance with a Noise Management and Monitoring Scheme which has been reviewed and updated as part of this assessment (Appendix 2). Absolute noise levels from site operations are expected to remain within the noise limits specified within the approved noise management and monitoring scheme currently in operation at the site.

- *Character of the Sound* – As part of the assessment the character of the proposed sound has been assessed and it is not considered that any acoustic features will increase the significance of noise impact. The proposed development will not exacerbate the prominence of any acoustic features or introduce any new acoustic features at the site. The potential for acoustic features to increase the impact will be minimised via the continued implementation of effective noise and vibration control measures which will be detailed in the updated management plan;

- *Assessment Approach* – All noise level predictions have been calculated with the combinations of plant working at the closest point to the receptor location. The calculations are therefore worst case scenarios which may be of relatively short duration. However, they indicate the potential highest $L_{Aeq,1h}$ (free-field) noise level to which a particular property or group of properties may be exposed during the working of the site. By definition, the worst-case situation may occur intermittently over the lifetime of the site, but longer term noise levels perceived outside of the site boundary would normally be significantly less;

- *Proposed Scheme* – The western extension of the site will move some operations further away from the nearest noise-sensitive receptors which are located to the east of the existing site.

Uncertainty

4.1.18 Whilst it is accepted that uncertainty can occur throughout all aspects of the measurement and assessment process, the approach undertaken at all stages has been adopted with the aim of reducing uncertainty via the implementation of good practice. During this process reference has been made to BS 4142 Annex B '*Consideration of uncertainty and good practice for reducing uncertainty*'[44].

4.1.19 The following list details the key steps taken to reduce uncertainty:

- Background sound level measurements were made in close proximity to the assessment locations and over a long duration to fully characterise the acoustic environment;
- Measurement procedures were in accordance with Section 6 of BS 4142 including precautions against interference such as unsuitable weather conditions;
- Site noise emissions levels were determined by measurement and calculation with reference to Section 7 of BS 4142 and utilising the methodology outlined within BS 5228[45], which is a widely accepted standard for the calculation of sound propagation from open sites. Site specific data was obtained by measurement of plant and activities in operation at the current site.

[44] Annex B. BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound, British Standards Institution 2019.

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

- Site activities occurring during the on-site sample measurements were considered to be representative of typical operating conditions and the measurement durations were considered to be representative of any longer term fluctuations in the specific sound. The influence of sound from other sources was minimised by measuring at times when the residual sound had subsided to a relatively low level;

- The instrumentation used was in accordance with Section 5 of BS 4142. Digital transfer methods were used and each piece of equipment has had its conformity and calibration checked periodically.

Outcome

4.1.20 Following an initial estimate of noise impact, along with consideration of the context and any potential effects of uncertainty, it is considered that the implementation of the proposed scheme is not likely to result in 'adverse' or 'significant adverse' impacts in accordance with BS 4142[46].

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

4.2 Planning Practice Guidance – Noise

4.2.1 In relation to the noise exposure hierarchy outlined in PPG-Noise[47] which supports the NPPF[48] and NPSE[49], it is suggested that potential noise at the most affected noise-sensitive premises is likely to be occasionally present but not intrusive and therefore considered to be at or below the 'Lowest Observed Adverse Effect Level (LOAEL). At this level noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. It can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.

4.2.2 The proposed development is therefore considered to be consistent with the aims of the NPPF (and also the NPSE and the Hazardous Waste NPS[50]) which seek to avoid noise giving rise to significant adverse impacts on health and the quality of life.

4.3 Planning Practice Guidance – Minerals

4.3.1 Waste disposal sites share many common features with surface mineral working, and planning authorities often take account of the Government guidance relating to noise emissions from mineral sites[51] when evaluating the noise impact of waste development. Historically, this has been the case at the ENRMF site. This section considers the proposed development within the context of this guidance.

4.3.2 PPG-Minerals states that 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 ($L_{A90,1h}$) by more than 10dB(A) during normal working hours (0700 – 1900).

[47] Paragraph: 005 Reference ID: 30-005-20190722. Planning Practice Guidance: Noise – Ministry of Housing, Communities and Local Government. July 2019.
[48] National Planning Policy Framework – Ministry of Housing, Communities and Local Government. July 2021.
[49] Noise Policy Statement for England. Government Department for Environment, Food and Rural Affairs. March 2010.
[50] Noise National Policy Statement for Hazardous Waste: A framework document for planning decisions on nationally significant hazardous waste infrastructure. June 2013. DEFRA
51 Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. October 2014.

4.3.3 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) $L_{Aeq,1h\ (free\ field)}$.

4.3.4 For operations during the evening (1900-2200) the noise limits should not exceed the background noise level ($L_{A90,1h}$) by more than 10dB(A) and should not exceed 55dB(A) $L_{Aeq,1h\ (free\ field)}$.

4.3.5 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) $L_{Aeq,1h\ (free\ field)}$ at a noise sensitive property[52].

4.3.6 Tables 24 and 25 below demonstrate that when the indicative worst-case site noise levels are compared to the PPG minerals guidance it can be seen that potential noise levels associated with the proposed development are not expected to exceed the daytime background level by more than 10 dB nor exceed the recommended maximum daytime limit of 55 dB. Furthermore, night-time noise levels during night-time periods are expected to remain well within the recommended 42 dB limit.

[52] Paragraph: 021 Reference ID: 27-021-20140306. Planning Practice Guidance: Minerals – Ministry of Housing, Communities and Local Government. 2014.

Assessment Location	Daytime Background Noise Level	Site Noise Level ($L_{Aeq,1h}$ dB)	Difference	
			Background Noise Level	PPG Limit 55 dB
Westhay Cottages	45	48	+3	-7
Westhay Farm	45	48	+3	-7
Westhay Lodge	36	38	+2	-17
Cuckoo Lodge	51	38	-13	-17
Duddington Village	49	30	-19	-25

Table 24. Assessment against PPG-Minerals Noise Standards (Daytime)

Assessment Location	Site Noise Level dB	Difference between site noise and PPG Limit of 42 dB
Westhay Cottages	22	-20
Westhay Farm	26	-16
Westhay Lodge	24	-18
Cuckoo Lodge	26	-16
Duddington Village	20	-22

Table 25. Assessment against PPG-Minerals Noise Standards (Night-time)

4.3.7 When noise associated with the proposed application is considered against this guidance, it is demonstrated that the potential noise impacts are not likely to be significant and therefore in accordance with the aims of the NPPF which seek to avoid noise giving rise to significant adverse impacts on health and the quality of life.

4.4 Public Rights of Way

4.4.1 In addition to minimising potential adverse impacts and avoiding significant adverse impacts on health and the quality of life, the NPPF also states that planning policies and decisions should identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason. There are no numerical threshold values which are set in the guidance relating to noise impacts for public amenity areas including footpaths.

4.4.2 King's Cliffe Hills and Valleys Landscape Character Area is located to the west of the application site and is recognised within the North Northamptonshire JCS[53] as an area of tranquillity and a place where tranquillity should be preserved by minimising light and noise pollution and minimising the visual and traffic impacts of development.

4.4.3 For an area to justify being protected for its tranquillity, it is likely to be relatively undisturbed by noise from human sources that undermine the intrinsic character of the area. During the site visit and survey, observations of the baseline noise environment were made at three locations along Footpaths MX13 and MX15 which pass through King's Cliffe Hills and Valleys Landscape Character Area.

[53] North Northamptonshire Joint Core Strategy 2011 – 2031. July 2016. North Northamptonshire Joint Planning Unit.

4.4.4 It was noted that the soundscape varied in character at each of the three observation positions. Observations made by the surveyor indicate that road traffic noise and birdsong were audible at all locations with operations at Collyweston Quarry or the existing ENRMF site also audible depending on the location and proximity to each of these noise sources.

4.4.5 Although the proposed western extension will bring noise-generating operations closer to the footpaths in Fineshade Woods including the Assarts, the closest footpath (Footpath MX15) will still benefit from a minimum 100 metre buffer zone with most of the footpath located at much greater separation distances. The continued implementation of best-practice noise control measures during the working of the proposed extension area will further minimise any potential adverse impacts and place the development in line with the requirements of Policy 3 of the NNJCS[54].

4.4.6 Although the level of noise from the ENRMF may increase during certain stages of the development, when operations are taking place in the west of the ENRMF site, it is considered that the overall character of the acoustic environment along the footpaths will remain largely unchanged as a result of the proposals. The area will still be subject to birdsong and road traffic noise along with noise from operations at the ENRMF and Collyweston Quarry which range from audible to not-audible due to the transient nature of the receptor which in this instance is a user traversing the public footpath. Overall, it is considered that the potential impacts on tranquillity are not likely to be significant.

4.4.7 It should also be noted that there are many other aspects, other than noise, which come together to create a sense of tranquillity such as visual impact which is also being assessed and mitigated as part of the DCO application.

[54] North Northamptonshire Joint Core Strategy 2011 – 2031. July 2016. North Northamptonshire Joint Planning Unit.

4.5 Road Traffic Noise and Vibration

4.5.1 The application includes an increase in the consented throughput of waste to the waste treatment and recovery facility and an increase in the total waste input rate to the site from 250,000 tpa to 300,000 tpa. It is therefore necessary to consider the potential noise and vibration impacts from HGV movements associated with the proposals.

4.5.2 The National Policy Statement for Waste[55] requires waste planning authorities to consider the potential impact of noise in general terms but also makes specific reference to noise and vibration from goods vehicle traffic movements to and from a site. The following assessment addresses this aspect of the NPS.

4.5.3 East Northants Resource Management Facility is accessed from Stamford Road, via a priority controlled T-junction, which will be improved prior to the commencement of the proposed extension in line with a scheme that has already been approved by the local authority.

4.5.4 It is understood that the proposed development will generate up to 232 HGV trips per day which is an increase of 36 HGV movements when compared to the 2012 permitted trips. This equates to a percentage increase of just over 18%.

4.5.5 In general terms, a change in road traffic noise of 1 dB is the smallest that is typically considered perceptible and is often used as a threshold against which to scope out the need for detailed operational traffic noise assessment. A change in noise level of +1 dB is approximately equivalent to a 25% increase in traffic flow[56].

55 National Policy Statement for Waste. October 2014. Department for Communities and Local Government.
56 Annex 1 of Design Manual for Road and Bridges. Vol.11 Section 3 Part 7. HD213/11 Noise and Vibration. The Highways Agency, November 2011 [NB. LA111 supersedes HD213/11 which is withdrawn].

4.5.6 The percentage increase associated with the proposed development is significantly lower than the 25% change considered necessary to be perceptible and the potential increase in HGV traffic noise levels due to the proposed scheme is therefore not considered to be significant. Once distributed on the wider highway network the number of trips will dilute further and the likelihood of potential impacts will be further reduced.

4.5.7 In terms of vibration, research by the Transport Research Laboratory[57] [58] (TRL) has found that people's reaction to traffic vibration is similar to their reaction to traffic noise but is less marked. As such, it is usual to regard any potential increase in vehicle induced vibration as acceptable, provided that any corresponding noise increase is also considered to be acceptable.

4.5.8 Traffic vibration dissipates fairly rapidly with distance and significant impacts are only typically related to vibration sensitive premises which are sited in very close proximity to a road. The most exposed receptors to potential vibration generated by ENRMF traffic are Westhay Cottages which are set back from the edge of Stamford Road by approximately 12 metres providing a reasonable buffer zone relative to HGV movements.

4.5.9 Furthermore it should be noted that, since ground-borne vibrations from vehicles are typically generated by irregularities in the road surface, vibration is unlikely to be important when considering disturbance from roads which are subject to maintenance work such as Stamford Road which has been recently resurfaced in the vicinity of the site access. Augean South Ltd will continue to provide an agreed sum for highway maintenance to the Local Authority annually as set out in the Section 106 Agreement. The purpose of this sum is for the Local Authority to provide any additional maintenance needed as a result of the use associated with activities at ENRMF of the surface of the road between the site access and

[57] TRRL Laboratory Report 1020 – Vibration nuisance from road traffic at fourteen residential sites. Transport and Road Research Laboratory. Department of Environment. Department of Transport. 1981
[58] TRRL Laboratory Report 1119 – Vibration nuisance from road traffic – results of a 50 site survey. Transport and Road Research Laboratory. Department of Transport. 1984

the junction with the A47. In accordance with the routing agreement all HGVs must turn left out of the site to travel to the A47.

4.5.10 It is therefore unlikely that noise and vibration from site traffic will have the potential to lead to significant adverse effects.

4.6 Vibration from Plant and Machinery

4.6.1 The primary cause of ground vibration on landfill sites, surface mineral extraction sites and construction sites is blasting and piling. Neither activity is proposed as part of the application.

4.6.2 Vibration generated by activities on the ENRMF site consists predominantly of mobile plant movements including loading shovels, excavators, dozers and dumptrucks. These sources of vibration are fairly low in intensity and tend to be localised with vibration levels dissipating readily over short distances. As a result vibration from these sources is rarely perceptible beyond the site boundary.

4.6.3 The intensity of vibration at the point of interest will normally be a function of many variables the most notable being the distance between source and receiver. Given the separation distances between sensitive receptors and the proposed application boundary, it is unlikely that vibration levels from these sources will be perceptible at the identified assessment locations.

4.6.4 Furthermore it should be noted that the proposed application will take on-site vibration sources further away from the closest receptors located to the east of the site on Stamford Road. Operations within the proposed western extension area including the existing waste treatment and recovery facility would occur at least 600 metres from the nearest sensitive receptors.

4.6.5 Levels of vibration from heavy plant and machinery operating on the site are considered to be negligible and, with the added implementation of the measures detailed in the updated Noise and Vibration Management Plan, it is concluded that there will no significant adverse effects.

4.7 Construction Noise and Vibration

4.7.1 Based on the results of the baseline noise survey which has established the existing ambient noise levels, and with reference to the 'ABC method' detailed in Annex E.3.2 of BS 5228-1, Table 26 below specifies a threshold level at noise-sensitive premises above which there could be a significant effect during the construction phase of the development.

Location	Daytime Ambient Noise Level dB(A)	Rounded to nearest 5 dB	Category	Threshold Level * dB(A)
Westhay Cottages	63	65	B	**70**
Westhay Farm	63	65	B	**70**
Westhay Lodge	52	50	A	**65**
Cuckoo Lodge	65	65	B	**70**
Duddington Village	60	60	A	**65**

** threshold values relate to the average site noise level ($L_{Aeq,T}$) over the duration of the working day.*

Table 26. Threshold of potential significant effects at dwellings from Construction Noise

4.7.2 The construction phase is not considered as a separate stage to the operation of the development in this assessment as the operations of extraction, construction of the engineered void, landfilling, construction of the engineered cap and restoration are sequential and take place concurrently in different phases of the site as the development proceeds. Accordingly the potential noise levels calculated take into account all these activities operating at the same time. Nevertheless, when the indicative worst-case site noise levels (presented in Table 17) are compared to the noise threshold levels of 65 or 70 dB(A) for construction activities it is evident that the potential noise levels associated with the development including construction activities are likely to remain within the recommended threshold values and are therefore not considered to be significant.

4.8 Assessment Summary

4.8.1 An assessment of potential noise and vibration impact has been made with reference to current planning policy and guidance along with a number of technical guidance documents.

4.8.2 The results of the assessment indicate that there are unlikely to be any significant or unacceptable adverse impacts at sensitive premises in the vicinity of the proposed operations.

4.8.3 It is considered that the potential impacts of noise on tranquillity as experienced by people using rights of way in Fineshade Woods are not likely to be significant.

4.8.4 The overall potential impact of the development is considered to be in line with national and local planning policy which seeks to prevent and avoid any significant or unacceptable adverse impacts and, where necessary, mitigate and reduce to a minimum other adverse impacts.

4.8.5 Measures to minimise noise and vibration emissions from the site are outlined in Chapter 5 of this report.

5.0 MITIGATION AND MONITORING

5.1 Noise and Vibration Minimisation and Control

5.1.1 The results of the assessment indicate that no specific mitigation measures are considered necessary, however, the site operator will continue to implement a range of best practice control measures during the working of the proposed extension area in line with those currently in place at the existing site.

5.1.2 Activities associated with the development of the western extension, including the continuation of operations at the existing site, have been reviewed and the following control measures have been identified to minimise any potential adverse impacts:

- The permitted operating hours of the site should be strictly adhered to and effectively communicated to all site staff and subcontractors;
- Plant and machinery should be maintained in good working order and used in accordance with the manufacturer's instructions. Any defective items should not be used. Regular inspections of plant should be undertaken to identify any faults or wear and tear that may be resulting in excessive noise and/or vibration;
- Keep vehicle routes through the site well maintained and free from defects such as pot-holes. Avoid the use of speed humps and steep gradients where possible;

- Avoid unnecessary horn usage, excessive revving, rapid acceleration and sharp braking. Equipment should be switched off or throttled down to a minimum when not required. Any covers, panels or enclosure doors to engines should be kept closed when the equipment is in use;

- Ensure that any cladding or enclosures around noise-generating plant are regularly inspected for defects/damage/weathering that may negatively impact upon the sound insulation performance of the structure. Once identified any repairs should be carried in a timely manner;

- Minimise drop heights of materials where possible;

- Where reasonably practicable, equipment should be located as far from sensitive premises as possible. Plant from which the noise generated is known to be particularly directional should, wherever practicable, be orientated so that the noise is directed away from noise-sensitive areas;

- Plant and vehicles should be started up sequentially rather than all together. Any period of idling required to warm up mobile plant at the start of the working day should be undertaken in locations away from residential premises;

- In the event of any emergency or unforeseen circumstances arising that cause safety to be put at risk, it is important that every effort be made to ensure that the work in question is completed as quickly and as quietly as possible and with the minimum of disturbance to people living or working nearby;

- Operatives should be trained to employ appropriate techniques to keep site noise and vibration to a minimum, and should be effectively supervised to ensure that best working practice in respect of noise minimisation is followed.

5.1.3 These measures will be included in the site's Noise and Vibration Management Plan which forms part of the DCO Environmental Commitments.

5.2 Management and Monitoring

5.2.1 Noise emissions from the site are currently controlled via a Noise Management and Monitoring Scheme (MJCA Report Ref: AU/KCE/SPS/1604/01 dated March 2012).

5.2.2 The compliance monitoring carried out as part of the noise survey demonstrates that the noise levels associated with the current site activities at the nearest approved monitoring location (Westhay Cottages) were within the relevant noise limit.

5.2.3 The existing Noise Monitoring and Management Scheme has been reviewed for the purposes of the DCO application and an updated Noise and Vibration Management Plan is presented in Appendix 2.

6.0 CUMULATIVE IMPACTS

6.1 The cumulative impact of mineral and waste development is capable of being a material planning consideration when determining individual planning applications. Hence it is necessary to consider the cumulation of the impact with the impact of other existing and/or approved development.

6.2 The former Northamptonshire County Council confirmed that the developments that should be considered with respect to cumulative impacts include Collyweston Quarry, Wakerley Quarry, Cooks Hole Quarry and Thornhaugh Quarry. Cooks Hole Quarry and Thornhaugh Quarry/Landfill located approximately 3.5 km to the east and Wakerley Quarry located approximately 5 km to the west. These sites are too distant from the ENRMF site to warrant the need to consider the potential cumulative impacts of noise.

6.3 Collyweston Quarry lies approximately 500m to the west of the proposed western extension area. Noise-sensitive premises that could be considered common to both Collyweston Quarry and ENRMF comprise Duddington Village and Cuckoo Lodge.

6.4 As part of the assessment worst-case external noise level associated with the proposed DCO application are estimated to be around 30 dB $L_{Aeq,1h}$ (free-field) at residential premises on the east side of the village and up to 38 dB at Cuckoo Lodge.

6.5 Noise levels of this magnitude, which are estimated to be at least 13 dB below the typical daytime background sound levels, will make no significant contribution to cumulative noise levels associated with the operation of both Collyweston Quarry and the ENRMF site.

6.6 Observations made during the assessment of the noise environment in Fineshade Woods to the west of the site suggest that, due to the curved geometry of Footpath MX15, noise associated with operations at the proposed development site and Collyweston Quarry are considered to be audible independently of each other, rather than cumulatively, as the route is traversed.

6.7 Overall, the cumulative noise impacts of noise are not considered to be significant as a result of the proposed development.

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8.0 GLOSSARY OF TECHNICAL TERMS

A-weighting	The human ear is most sensitive to frequencies in the range 1 kHz to 5 kHz. On each side of this range the sensitivity falls off. A-weighting is used in sound level meters to replicate this sensitivity and respond in the same way as the human ear.
Abstraction	The removal of water or gas from any source either permanently or temporarily.
Acoustic Environment	Sound from all sound sources as modified by the environment.
Aftercare	The steps necessary to manage the land following restoration so that the quality of the land is at a satisfactory standard for the planned afteruse.
Ambient Sound Level $L_{Aeq,T}$	Totally encompassing sound in a given situation at a given time usually composed of sound from many sources near and far.
Background Sound Level $L_{A90,T}$	The A-weighted sound pressure level of the residual sound at the assessment position that is exceeded for 90% of a given time interval, T, measured using time weighting F.
Baseline Scenario	A description of the state of the environment without implementation of the project.
Basic Noise Level	The basic noise level (BNL) is a measure of source noise.
BAT	Best Available Techniques. The available techniques which are the best for preventing or minimising emissions and impacts on the environment.
Bund	A low bank or wall of material used to store soils or to provide a visual or acoustic screen.
Cumulative impact	The combined positive and negative impacts on a specific receptor or medium.

DEFRA	Government Department for Environment, Food and Rural Affairs
Disposal	Emplacement of waste in an appropriate facility without the intention of retrieval.
EA	Environment Agency. The national environmental regulator.
EIA	Environmental Impact Assessment. A process to assess the environmental implications of proposals.
Environmental Statement (ES)	The document that reports the findings of an Environmental Impact Assessment.
EP	Environmental Permit. The authorisation issued by the Environment Agency when it is satisfied that the operation can be operated without pollution of the environment or harm to human health.
EPR2016	The Environmental Permitting (England and Wales) Regulations 2016. The principal regulations controlling waste management.
Equivalent continuous A-weighted sound pressure level $L_{Aeq,T}$	Value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval T, has the same mean square sound pressure as a sound under consideration whose level varies with time.
Free-field Level	The sound pressure level away from reflecting surfaces. Measurements made 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces are usually regarded as free-field.
Ha	Hectare. A unit of area.
$L_{A10,18hr}$	The noise level, in dB, that is exceeded 10% of the time between 0600 and 2400.
Landfill gas	An end product of the degradation of biodegradable wastes in a landfill site comprising largely methane and carbon dioxide.
Leachate	Liquid which seeps through waste in a landfill and

	becomes contaminated by the deposited waste. The leachate is collected in a drainage layer constructed below the waste in each landfill cell.
LLW	Low Level Radioactive Waste. With certain specific exceptions LLW is defined as waste which has an activity concentration in the range 0.4 – 4,000 Bq/g for alpha emitters and up to 12,000 Bq/g for beta-gamma emitters.
LOAEL	Lowest observed adverse effect level.
NGR	National Grid Reference.
NMP	Noise Management Plan
NOEL	No observed effect level.
NPPF	National Planning Policy Framework which provides the primary policy basis for planning decisions.
NPSE	Noise Policy Statement for England.
PPG	Planning Practice Guidance.
PPV	Peak Particle Velocity. The instantaneous maximum velocity reached by a vibrating element as it oscillates about its rest position.
Rating Level $L_{Ar,Tr}$	The specific sound level plus any adjustment for the characteristic features of the sound.
Reference Time Interval, T_r	The specified interval over which the specific sound level is determined. This is 1hr during the day (07:00-23:00) and a shorter period of 15 min at night (23:00-07:00).
Residual Sound Level $L_{Aeq,T}$	Ambient sound remaining at a given position in a given situation when the specific sound source is suppressed to a degree such that it does not contribute to the ambient sound.
SOAEL	Significant observed adverse effect level.
Sound Power Level, L_{WA}	The total amount of sound energy per unit of time generated by a particular sound source

	independent of the acoustic environment that it is in. It is a logarithmic measure of the sound power in comparison to a specified reference level.
Specific Sound Level (also referred to as 'site noise') $L_{Aeq,Tr}$	Sound in the neighbourhood of a site that originates from the site i.e. the sound being assessed. The equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment position over a given reference time interval.
Vibration	A to-and-fro motion which oscillates about a fixed equilibrium position.
VDV	Vibration Dose Value. A measure of the total vibration experienced over a specified period of time.

FIGURE 1

Location Plan

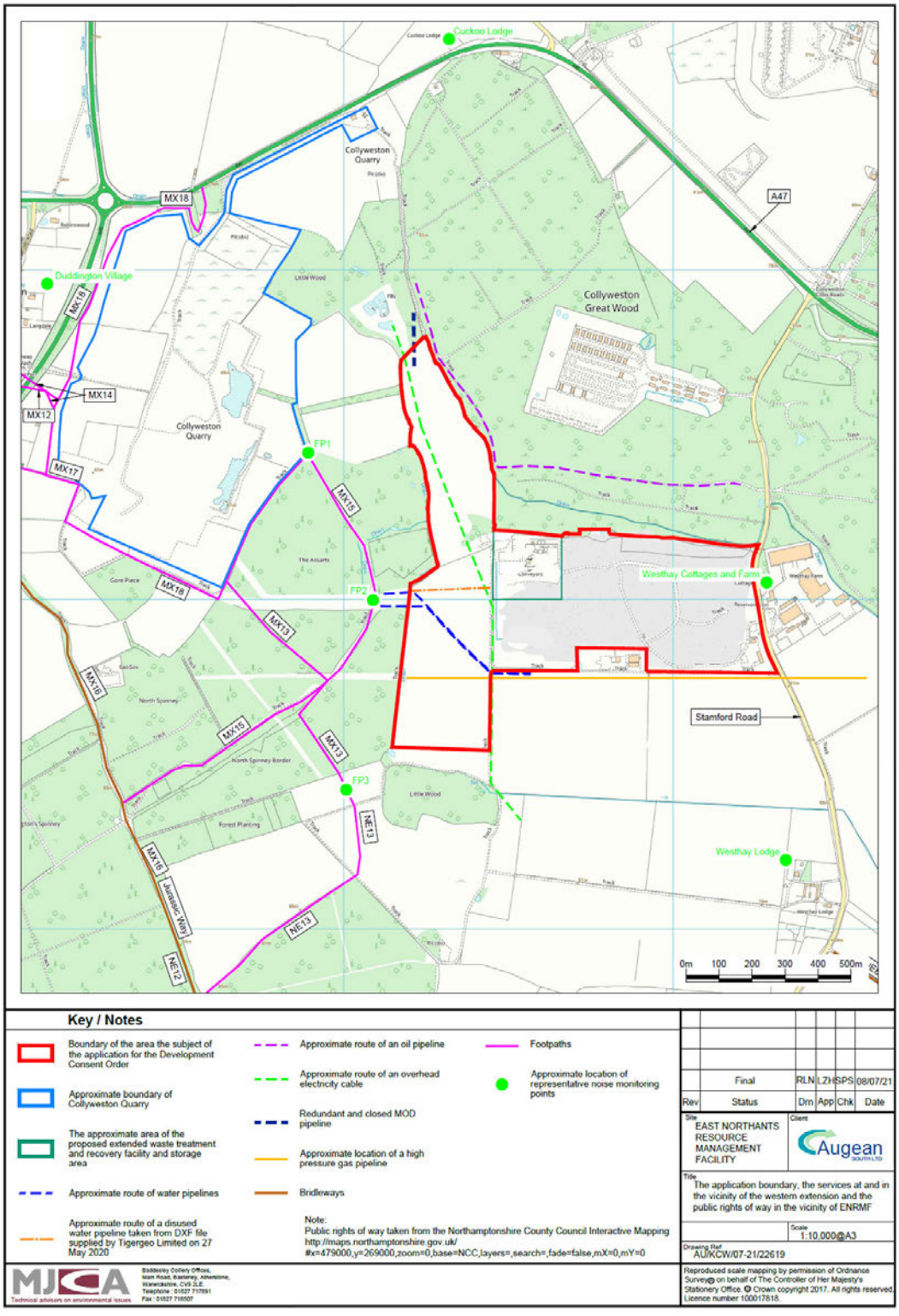
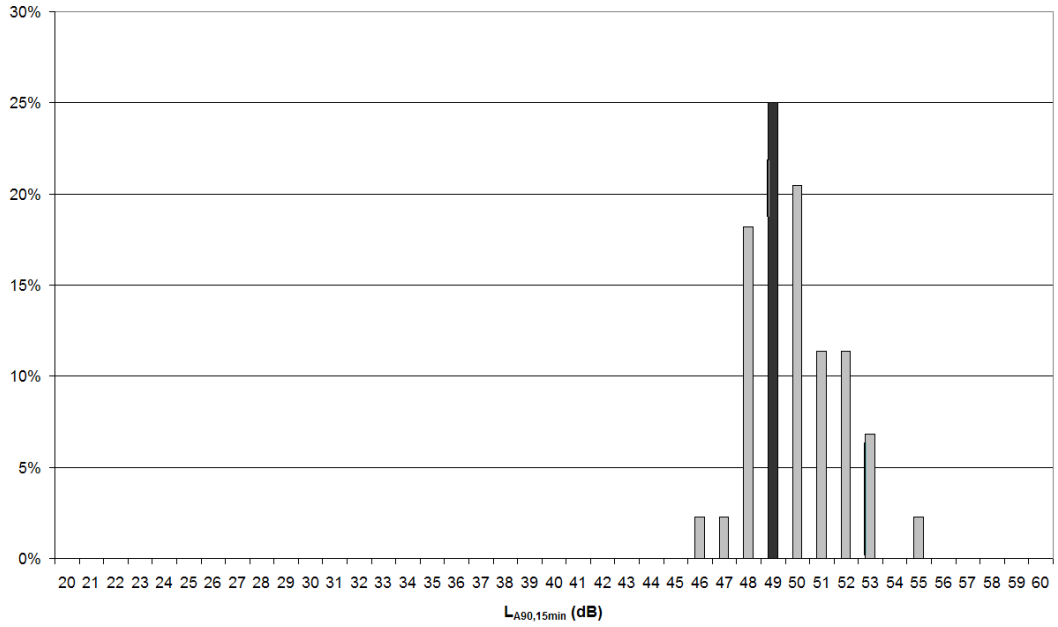


FIGURE 2

Statistical Analysis to Determine the Background Sound Level

Location: Duddington Village

Daytime (0700 – 1800)



Night-time (2300 – 0700)

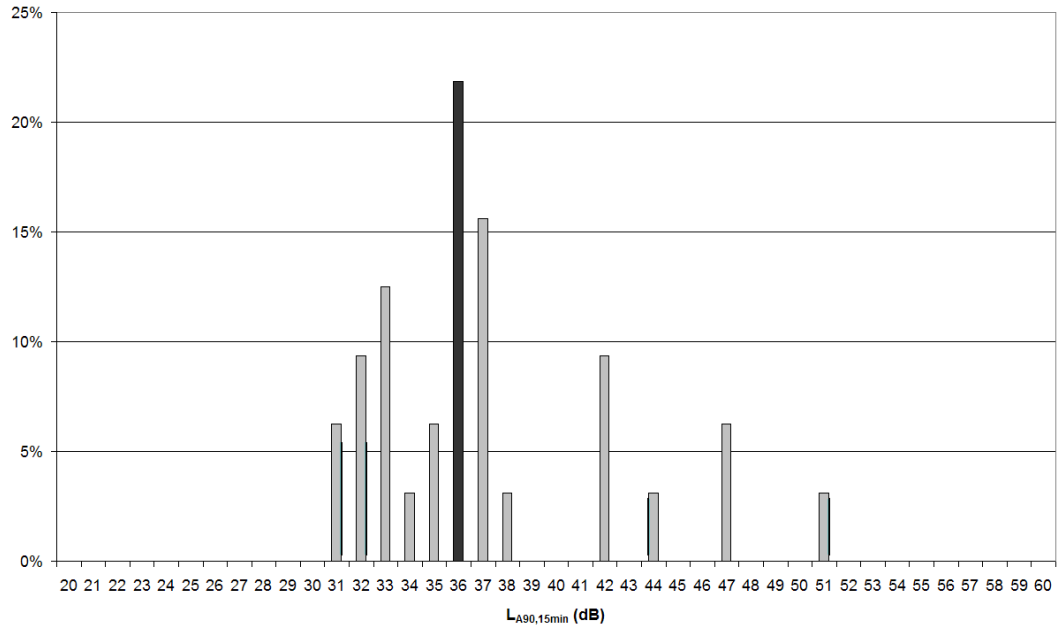
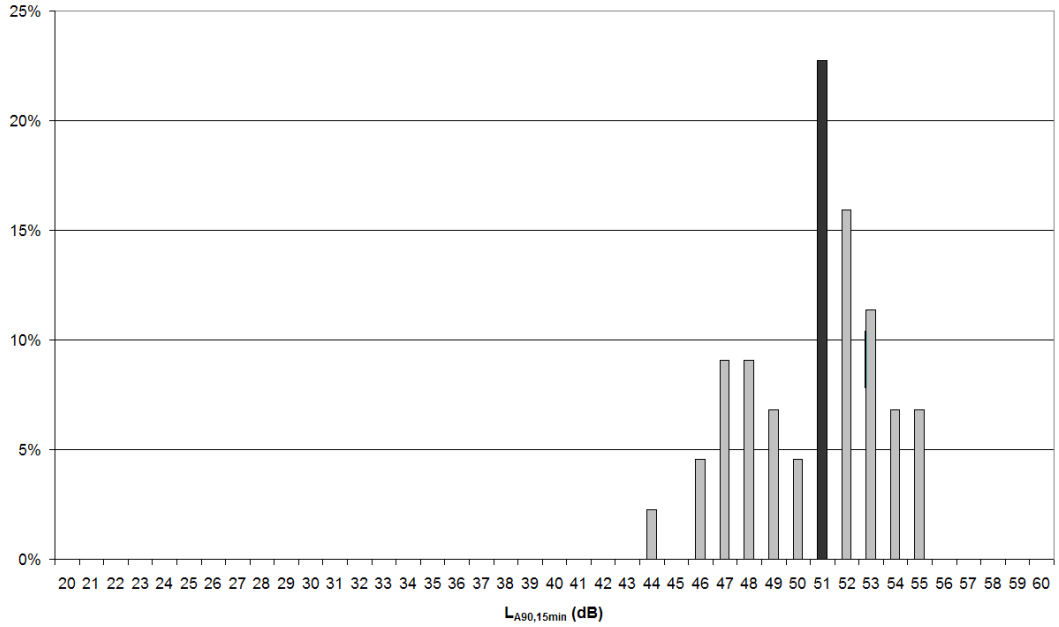


FIGURE 3

Statistical Analysis to Determine the Background Sound Level

Location: Cuckoo Lodge

Daytime (0700 – 1800)



Night-time (2300 – 0700)

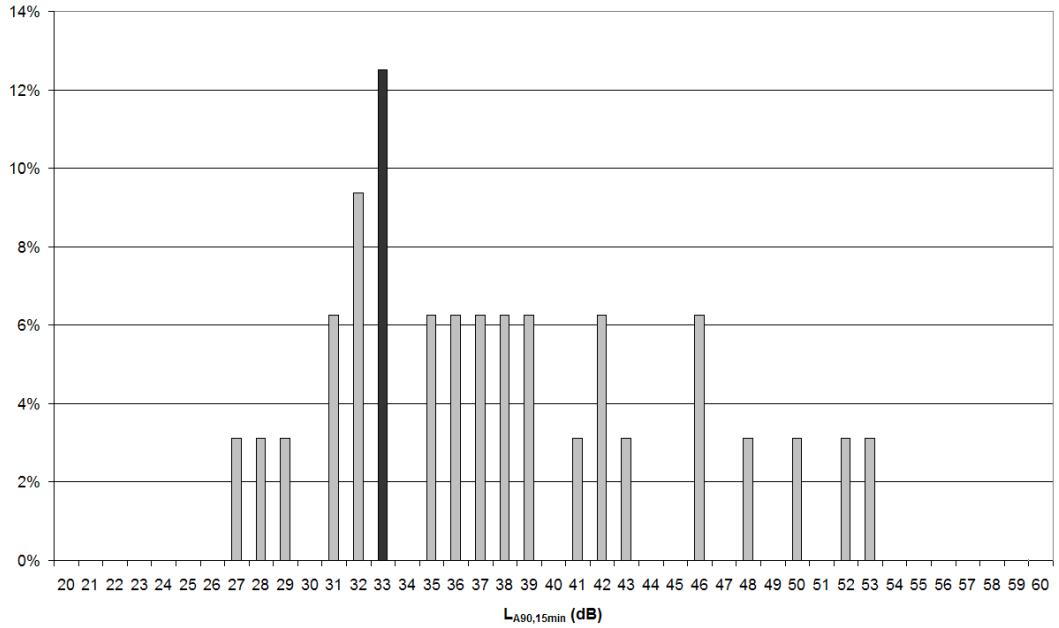
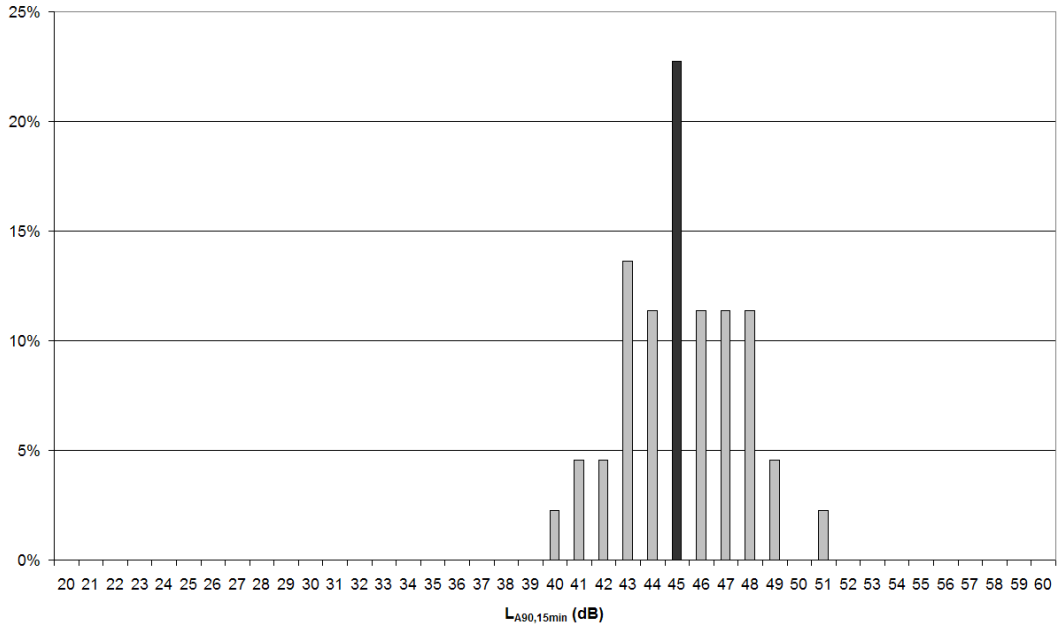


FIGURE 4

Statistical Analysis to Determine the Background Sound Level

Location: Westhay Cottages and Farm

Daytime (0700 – 1800)



Night-time (2300 – 0700)

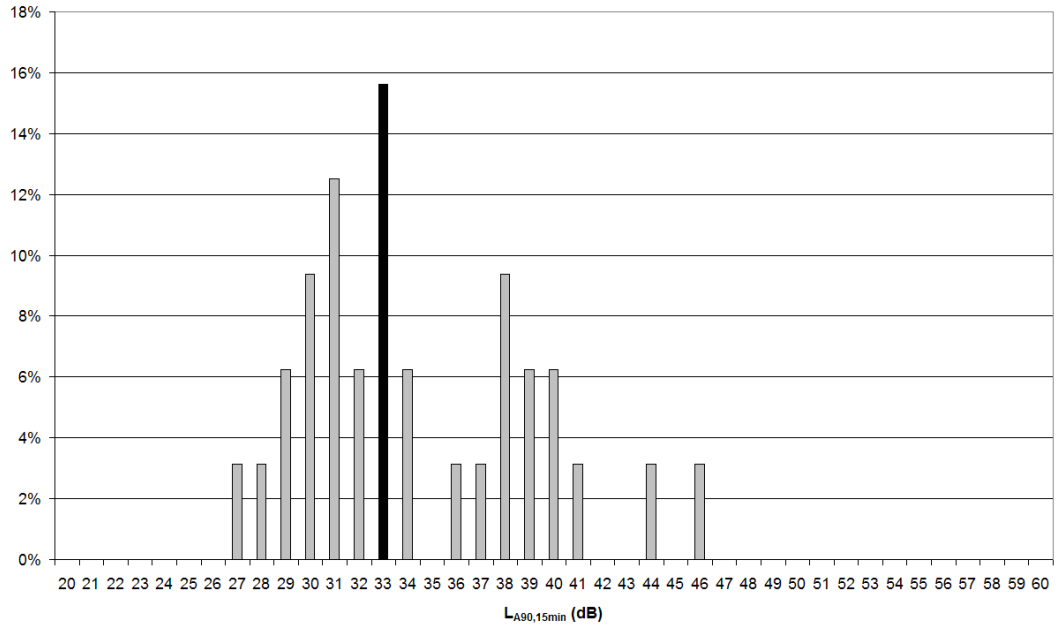
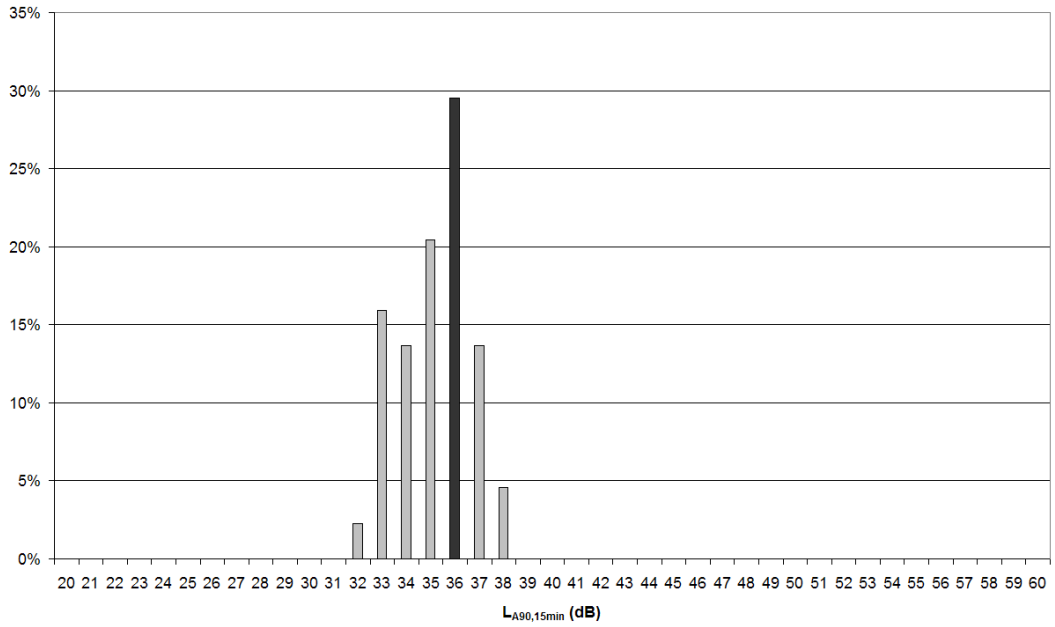


FIGURE 5

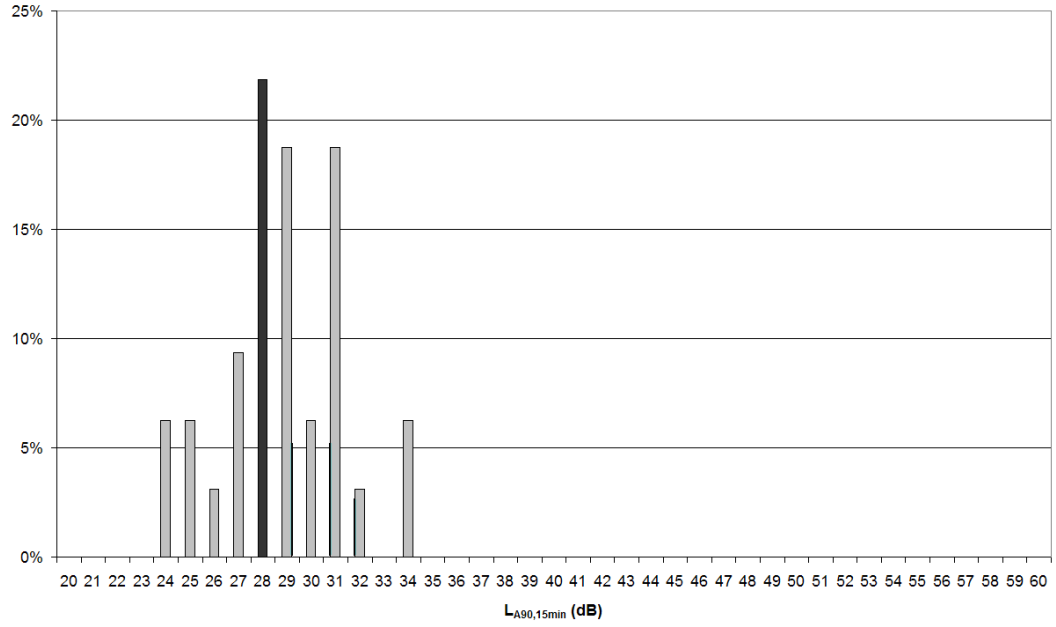
Statistical Analysis to Determine the Background Sound Level

Location: Westhay Lodge

Daytime (0700 – 1800)



Night-time (2300 – 0700)



APPENDIX 1

Details of Initial Consultation – NVIA Methodology

Email to East Northamptonshire Council Requesting Comment on the Proposed Assessment Methodology

From: [redacted]
Sent: Tuesday, May 26, 2020 4:05 PM
To: envprotect@east-northamptonshire.gov.uk
Subject: Potential Extension to ENRMF - Proposed Noise Impact Assessment Methodology

Good afternoon,

Vibrock Ltd have been instructed by Augean plc to undertake a noise impact assessment to accompany a planning application for a proposed western extension to East Northants Resource Management Facility (ENRMF) at Stamford Road, Kings Cliffe, PE8 6XX.

I would like to propose an assessment methodology for consideration by the Environmental Protection department in order to agree upon a suitable approach prior to undertaking this work. Back in 2011/12 Vibrock undertook a similar study at this site and consulted with [redacted], however, I understand that [redacted] may no longer be at East Northamptonshire Council.

I would appreciate it if the proposed approach, detailed in the attachment which accompanies this email, could reviewed and comment provided.

Should you have any questions, please do not hesitate to contact me using the details below.

Kind Regards

Andrew Pickford
E: [redacted]

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APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Email to Northamptonshire County Council Requesting Comment on the Proposed Assessment Methodology

From: [redacted]
Sent: Thursday, June 18, 2020 1:04 PM
To: [redacted]@northamptonshire.gov.uk
Subject: Potential Extension to ENRMF - Noise

Good afternoon [redacted],

Vibrock Ltd have been instructed by Augean plc to undertake a noise impact assessment to accompany a planning application for a potential western extension to East Northants Resource Management Facility (ENRMF) at Stamford Road, Kings Cliffe, PE8 6XX. I understand you may have recently provided comments on the LVIA viewpoints.

I would like to propose a noise assessment methodology for consideration by Development Control in order to agree upon a suitable approach prior to undertaking this work.

I would appreciate it if the proposed approach, detailed in the attachment which accompanies this email, could reviewed and comment provided. We are also seeking comment from [redacted], Senior EHO at East Northamptonshire and the Environment Agency.

Should you have any questions, please do not hesitate to contact me using the details below.

Kind Regards

Andrew

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E: [redacted]

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VAT Registered Number GB716487610

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Email to Environment Agency Requesting Comment on the Proposed Assessment Methodology

From [redacted]
Sent: Thursday, June 18, 2020 1:07 PM
To: [redacted]@environment-agency.gov.uk

Good afternoon [redacted],

Vibrock Ltd have been instructed by Augean plc to undertake a noise impact assessment to accompany a planning application for a potential western extension to East Northants Resource Management Facility (ENRMF) at Stamford Road, Kings Cliffe, PE8 6XX. I understand you are the regulatory officer for this site.

I would like to propose a noise assessment methodology for consideration by the EA in order to agree upon a suitable approach prior to undertaking this work.

I would appreciate it if the proposed approach, detailed in the attachment which accompanies this email, could reviewed and comment provided. We are also seeking comment from [redacted], Senior EHO at East Northamptonshire and [redacted], Development Control Manager at Northamptonshire County Council.

Should you have any questions, please do not hesitate to contact me using the details below.

Kind Regards

Andrew

Andrew Pickford
E: [redacted]

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VAT Registered Number GB716487610

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (1 of 4)

26.05.20

Site: East Northants Resource Management Facility (ENRMF), Stamford Road, Kings Cliffe, PE8 6XX.

Proposal: Potential western extension to the existing ENRMF site

See attached Figure 1 showing the current site and the potential western extension area. If the application progresses the application boundary will comprise the current site and the potential western extension area.

Noise – Proposed Survey and Assessment Methodology

Survey

The COVID-19 outbreak presents new challenges in obtaining representative baseline sound levels because typical road, air and rail transport usage have been reduced by travel restrictions and social distancing measures.

Under normal circumstances, it would be proposed that baseline monitoring is conducted continuously and simultaneously at the 4 locations shown on Figure 2 over a period of at least 24 hours. The monitoring data would be used to establish the prevailing acoustic environment at existing noise-sensitive receptors within the vicinity of the site.

Joint guidance issued by The Association of Noise Consultants and The Institute of Acoustics in March 2020 suggested that, whilst normal working practices have been impacted, there will be a continuing requirement to maintain as far as possible the standard of working practices, to maintain the flow of acoustic reporting which has an important role in the fabric and functioning of society, and to allow the planning process (and other relevant processes) to continue as smoothly as possible, without what could be a delay of many months.

The joint guidance suggests other approaches that could be taken to establish an appropriate robust estimate of baseline conditions, such as using existing data (for example, from previous local surveys and noise maps). Fortunately, in the case of this proposed development, extensive background noise monitoring was undertaken by Vibrock Ltd in March 2011 as part of an application for a previous extension to the site. Monitoring was conducted at the 4 locations shown in Figure 2 and the approach was agreed with Environmental Protection at East Northamptonshire Council. A review of current noise-sensitive receptor locations in the vicinity of the proposed development suggests that these receptors remain appropriate for inclusion within any future noise impact assessment and it is understood that no new noise-sensitive development has occurred in closer proximity to the site during the intervening period.

At present the Covid-19 pandemic is continuing to result in environmental sound climates that may vary quite significantly from representative conditions. It is therefore proposed that, should monitoring of the current baseline conditions not be possible, the background noise data measured during the 2011 survey will be adopted as a suitable baseline against which to make an assessment of noise impact for the potential western extension.

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (2 of 4)

26.05.20

Assessment

Noise from the development will be assessed with reference to the NPPF and associated planning practice guidance along with any relevant local policy. In terms of technical noise guidance, emissions from operations associated with the potential western extension will be assessed primarily with reference to BS 4142:2014+A1:2019 '*Methods for rating and assessing industrial and commercial sound*' along with other relevant guidance and criteria as appropriate.

Noise predictions associated with the proposed development will be carried out using the methods in BS 5228-1:2009+A1:2014 '*Code of practice for noise and vibration control on construction and open sites*'. It is intended the sample noise measurements of noise-generating plant and activities at the current ENRMF site will be obtained to provide representative noise emission data for inclusion within these calculations.

It is understood that the proposals will not result in an increase in HGV traffic on the local road network and hence an assessment of road traffic noise will not be undertaken.

Where necessary mitigation measures will be recommended to ensure that there are no significant or unacceptable adverse impacts to residential amenity.

APPENDIX 1 (cont)

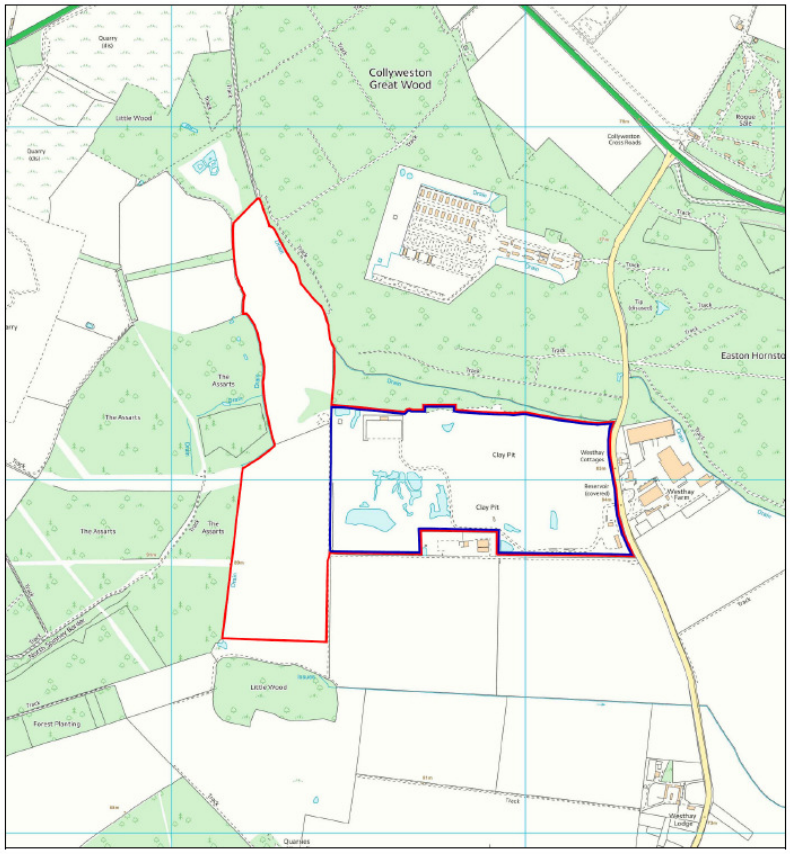
Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (3 of 4)

26.05.20

FIGURE 1

POTENTIAL WESTERN EXTENSION AREA



APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Proposed Noise Impact Assessment Methodology (4 of 4)

26.05.20

FIGURE 2

Noise Assessment Locations

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Consultation Response – East Northamptonshire Council

From: [redacted]@east-northamptonshire.gov.uk>
Date: 01 June 2020 12:39
To: [redacted]
Subject: FW: Potential Extension to ENRMF - Proposed Noise Impact Assessment Methodology

Dear [redacted]

Thank you for your email and the opportunity to comment on the methodology for the acoustic survey. As you clearly point out carrying an acoustic survey during Covid 19 presents a number of challenges. I have no issues with the approach you are suggesting taking into account the joint guidance issued by The Association of Noise Consultants and The Institute of Acoustics. One of the main challenges will be how to deal with uncertainties due to the unusual circumstances and would expect these to covered in some detail.

Are there any sensitive ecological receptors that need to be taken into consideration in which case you may have to consult Natural England.

I gather the acoustic survey report will be submitted in support of a planning application to extend the landfill site and would suggest, if you have not already done so, that you discuss your proposals with Northamptonshire County Council and the Environment Agency as they may have a different view.

Please call if you would like to discuss this matter further.

Regards

[redacted]

Senior Environmental Protection Officer
East Northamptonshire Council
Tel: 01832 742037

APPENDIX 1 (cont)

Details of Initial Consultation – NVIA Methodology

Consultation Response – Environment Agency

From: [redacted]@environment-agency.gov.uk>
Date: 22 June 2020 15:36
To: [redacted]@vibrock.com>
Cc:
Subject: Noise impact assessment

Hi [redacted]

Thank you for your e-mail.
In general the noise assessment proposal seems to be acceptable.

For Environmental Permitting the Environment Agency uses the BS4142 assessment procedure and it is this assessment which will form the significant part of any submission to the EA.
Obviously we would normally prefer data from recent surveys as this gives more confidence that the data represents the current noise climate around the site.

If it is possible to monitor the current baseline then I would recommend doing so – obviously bearing in mind social distancing and staff safety etc.
I accept that the baseline would potentially be affected by reduced traffic flow, potentially leading to a reduced background level and subsequent over estimation of any site impact, however we do not know when traffic will return to pre Covid-19 levels and may possibly be reduced for a significant period of time. Baseline data obtained now would also possibly provide a reasonable worst case scenario.
Alternatively, the traffic flow may well increase in the near future depending on how Government advice on social distancing and returning to work progresses, in which case the current baseline may be closer to a representative level than the 2011 data.

Obviously if you cannot collect the data due to staff concerns regarding Covid-19 then the 2011 baseline will have to be used.

Whatever method you decide to do, you will be able to explain your reasoning and any potential uncertainties in the BS4142 report.

I hope that helps, please feel free to contact me if you need any further information.

Regards

[redacted]
Regulatory Officer
Lincolnshire & Northamptonshire - South
Tel 02030256478

Environment Agency
Nene House
Pytchley Lodge Road
Pytchley Lodge Industrial Estate
Kettering
NN15 6JQ

APPENDIX 2

Noise and Vibration Management Plan

1.0 Introduction

1.1 The Noise and Vibration Management Plan (NVMP) outlines the methods by which Augean South Limited will systematically assess and minimise the potential impacts of noise generated by the proposed development at East Northants Resource Management Facility (ENRMF).

1.2 The proposed development comprises the construction of new landfill void to the west of the existing landfill facility (the proposed western extension) and the alteration of the restoration profile and the timescale for completion of the existing landfill site in order to integrate the final landscape of the existing site with the western extension. The proposed development also includes an alteration to the waste treatment and recovery facility and an extension of the operational period of the current site activities and the western extension to 2046.

1.3 The aims of the NVMP are:

- to prevent pollution and minimise disturbance and annoyance to residents;
- to develop a control strategy which can be implemented during site operations;
- to ensure that noise and vibration impacts are considered as part of routine inspections;

- to demonstrate good practice and that all appropriate measures are taken to prevent or, where that is not practicable, to reduce emissions from the operations;
- to consolidate any noise and vibration issues on the site to assist Augean in complying with Planning and Permit conditions;
- to assist the Local Planning Authority in enforcement and complaint responses.

2.0 Sources

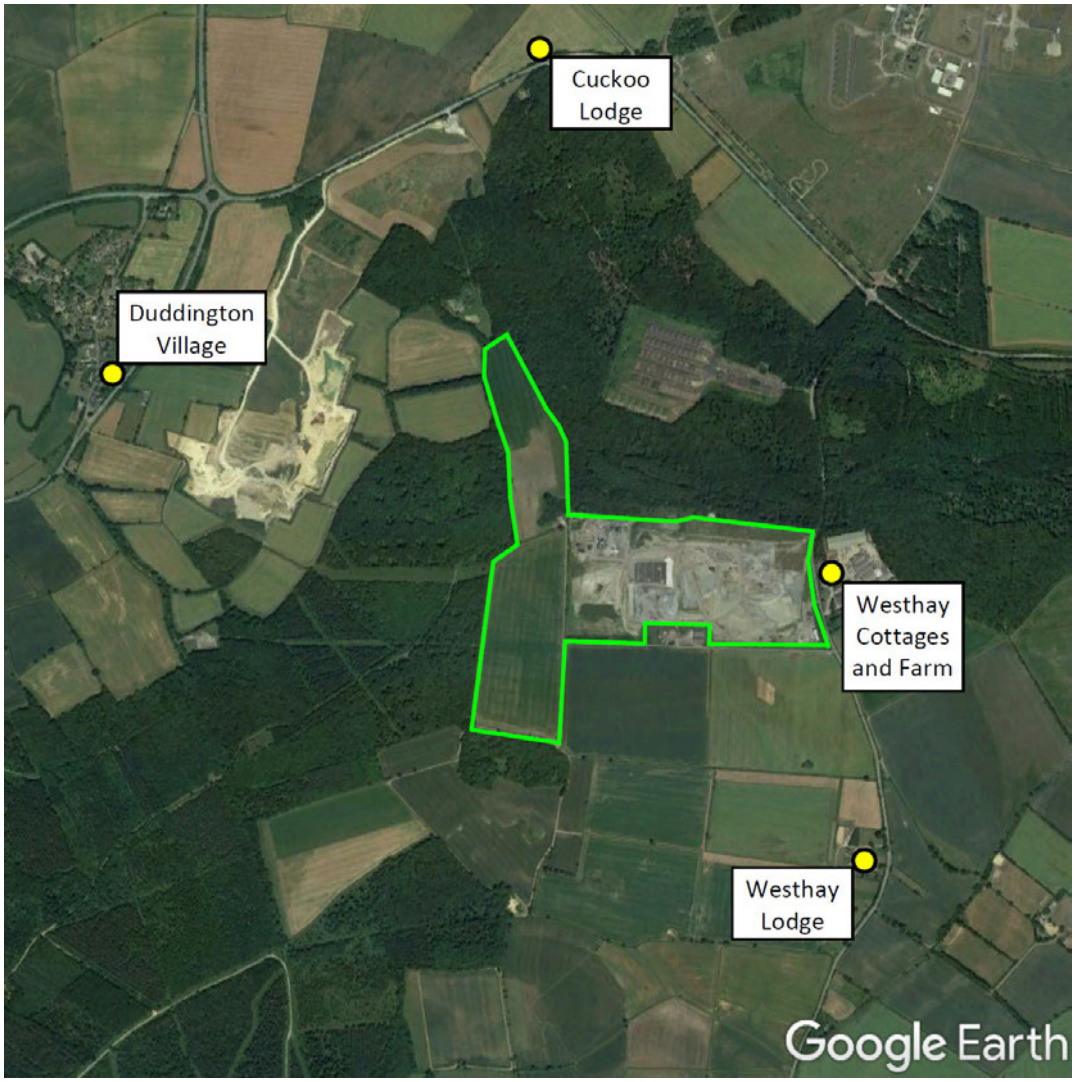
2.1 The proposed development comprises the construction of a new landfill void to the west of the existing landfill facility and the alteration of the restoration profile. The proposals also include an alteration to the waste treatment and recovery facility operations and an extension to the operational period of the current site activities and the western extension to 2046.

2.2 The main sources of noise and vibration are detailed below:

- Ongoing processing activities at the waste treatment and recovery facility and associated mobile plant movements;
- Landfill construction and engineering works;
- The winning and working of minerals including the extraction of soil, overburden and clay;
- Stockpiling of materials;
- Infilling of waste;
- Capping and restoration activities;
- Mobile plant movements;
- HGV movements.

3.0 Receptors

3.1 The nearest noise and vibration sensitive premises to the site are shown below.



4.0 Mitigation

4.1 The following control measures are in place at the existing ENRMF and will continue to be implemented to continue to manage noise and vibration from site operations. These measures demonstrate best practice and minimise any potential impacts:

- The permitted operating hours of the site will be strictly adhered to and effectively communicated to all site staff and subcontractors;
- Plant and machinery will be maintained in good working order and used in accordance with the manufacturer's instructions. Any defective items will not be used. Regular inspections of plant will be undertaken to identify any faults or wear and tear that may be resulting in excessive noise and/or vibration;
- Vehicle routes through the site will be kept maintained and free from defects such as pot-holes. The use of speed humps and steep gradients will be avoided where possible;
- Unnecessary horn usage, excessive revving of engines, rapid acceleration and sharp braking will be avoided. Equipment will be switched off or throttled down to a minimum when not required. Any covers, panels or enclosure doors to engines will be kept closed when the equipment is in use;
- Any cladding or enclosures around plant will be regularly inspected for defects/damage/weathering that may negatively impact upon the sound insulation performance of the structure. Once identified any repairs will be carried in a timely manner;
- The drop height of materials will be minimised where possible;

- Equipment will be located as far from sensitive premises as possible. Plant from which the noise generated is known to be particularly directional will, wherever practicable, be orientated so that the noise is directed away from sensitive areas;
- Plant and vehicles will be started up sequentially rather than all together. Any period of idling required to warm up mobile plant at the start of the working day will be undertaken in locations away from residential premises;
- In the event of any emergency or unforeseen circumstances arising that cause safety to be put at risk, every effort be made to ensure that the work in question is completed as quickly and as quietly as possible and with the minimum of disturbance to people living or working nearby;
- Operatives will be trained to employ appropriate techniques to keep site noise and vibration to a minimum, and will be effectively supervised to ensure that best working practice in respect of noise minimisation is followed.

5.0 Monitoring

Survey Periods

5.1 Noise monitoring shall be undertaken during typical working hours when the site is operating normally and avoiding:

- lunch/break times;
- periods of plant maintenance or breakdown; and
- periods of peak road traffic on the local road network.

5.2 Monitoring shall be undertaken for a minimum of 1 hour total duration during the operational hours on Monday to Friday between 0700 – 1800 hrs.

Monitoring Locations

5.3 Monitoring shall be undertaken in 'free-field' conditions, with the microphone placed at a height of between 1.2 - 1.5 metres above the ground and at least 3.5 metres away from other reflecting surfaces.

5.4 Monitoring shall be conducted at locations representing the following residential premises:

- Westhay Cottages and Farm
- Westhay Lodge
- Cuckoo Lodge
- Duddington Village

5.5 The exact location of the monitoring position will be decided prior to or during the survey visit depending on access and agreement with land owners/local residents.

5.6 Monitoring shall be undertaken either directly at the premises within an external amenity area, such as a private garden, or at an alternative location where the acoustic environment (including any contributions from the site) is considered to be similar.

5.7 Where possible, the selected monitoring locations should be accessible from public roads and footpaths and should also be available to the site operator as well as the regulators such as local authority officers.

5.8 In any event, full details of the selected monitoring locations shall be reported.

Measurement Parameters

5.9 The equivalent continuous A-weighted sound pressure level ($L_{Aeq,1hour}$) shall either be measured directly (over a minimum one-hour period) or calculated from a number of shorter contiguous or disaggregated measurements (e.g. 4 $\times$ $L_{Aeq,15min}$ or 2 $\times$ $L_{Aeq,30min}$) via logarithmic averaging.

5.10 L_{Amax} and L_{A90} noise levels shall also be recorded and reported.

5.11 Sound levels shall be measured using a 'fast' time weighting.

Sources of Interference

5.12 Precautions shall be taken to minimise the influence on the sound level readings from sources of interference such as temperature, wind, rain and electrical interference.

5.13 Monitoring shall be avoided during heavy precipitation and when wind speeds are greater than an average 5 ms^{-1} and when air temperatures are below 3°C.

5.14 All sound level meters shall be fitted with an effective windshield to minimise turbulence at the microphone.

5.15 Meteorological conditions prevailing during the monitoring shall be recorded and reported.

Observations

5.16 During the survey, detailed observations of the acoustic environment including the identification of any dominant sound sources will be recorded and reported.

5.17 Full details of the activities taking place at the ENRMF during the monitoring periods will also be recorded and reported.

Instrumentation

5.18 Instrumentation should preferably conform to Class/Type 1, but at least of Class/Type 2 as specified in either BS EN 61672-1:2013, BS 7580-1, BS 7580-2 or BS EN 60804.

5.19 Sound calibrators should preferably be Class/Type 1 and conform to BS EN 60942:2003, BS EN 60942 or BS 7189 (identical with IEC 942).

5.20 Sound level meters and field calibrators shall have had their conformity and calibration checked periodically in accordance with manufacturer recommendations or relevant standards.

5.21 With the equipment set up in the configuration used during measurement, field calibration checks shall be performed immediately before and after the survey period using a sound calibrator.

5.22 Any significant drift in the calibration value observed between the initial and final checks will be recorded and reported.

Reporting

5.23 Noise monitoring shall be undertaken on 2 occasions per year at approximately 6 month intervals.

5.24 Noise monitoring reports will be prepared within 2 weeks of the completion of the monitoring and will be kept at the site offices for review by the Local Planning Authority when requested.

5.25 The results of the survey shall be evaluated against a site noise limit of 55 dB $L_{Aeq,1h}$ free-field which is the limit specified in PPG for mineral/waste sites and has previously been adopted within the site's noise monitoring and management plan.

5.26 Where sound emissions from site activities are considered to have been the cause of a noise level above the specified limit, the Site Manager shall be notified and a review will be undertaken by the operator to determine the cause of the exceedance.

5.27 Following the review and, if practicable, the operator will implement suitable noise control measures in consultation with the Local Planning Authority.

6.0 Complaints

6.1 It is the duty of all members of staff to receive and record complaints, which will be processed by the Site Manager.

6.2 The Operator will maintain a record of all complaints received. Any complaints will be responded to and recorded in accordance with the Complaints Procedure which forms part of the site Environmental Management System. Further information is provided within the DCO Environmental Commitments.

6.3 The complaints log will be made available to the Local Planning Authority for inspection upon request.

6.4 All complaints will be investigated to identify the likely source of the noise and/or vibration. If it is established that the operator could be the source then further investigation will be undertaken to determine the scale of impact.

6.5 Should clear impacts from site operations be identified then, if practicable, the operator will implement suitable control measures in consultation with the Local Planning Authority.

6.6 During any investigation and subsequent remedial action, the complainant will be kept updated of progress.

7.0 Management, Training and Responsibility

7.1 The Site Manager will have responsibility for ensuring that nuisances and hazards arising from the operations due to noise and vibration are minimised, and that the measures outlined in this NVMP are implemented, documented and subject to ongoing evaluation and review through the procedure review process which forms part of the site Environmental Management System.

7.2 The Operator conducts its operations according to management systems that are designed to ensure that all staff are competent to carry out the tasks that have been designated their responsibility.

7.3 The company identifies training requirements of its employees and provides suitable resources to ensure they have the required knowledge, skills and expertise to carry out their duties. This includes their roles and responsibilities in complying the Operator's management systems and all relevant legislation. This is achieved through induction, training for new employees, awareness training for all and specific training as required as set out in the Environmental Management System.

7.4 Contractors and all persons performing tasks on behalf of Augean will also be made aware of the policy and relevant management system requirements and will be competent in the roles undertaken.

7.5 Operatives will be trained to employ appropriate techniques to keep site noise and vibration to a minimum and will be effectively supervised by the Site Manager to implement best working practice. All operational staff and contractors will be responsible for reporting any problems relating to noise and vibration directly to the Site Manager.

7.6 All staff at the site will be made fully aware of the need to be constantly vigilant about the control and management procedures in place. To minimise the risk of noise and vibration emissions, emphasis will be given to:

- Awareness of their responsibilities for avoiding noise nuisance;
- The timely reporting of noise issues directly to the Site Manager; and
- Actions to minimise noise emissions during abnormal operating scenarios that could give rise to noise issues.