PEMBROKESHIRE COUNTY COUNCIL ECO-PARK

# ENVIRONMENTAL PERMIT APPLICATION

Noise Impact Assessment and Noise Management Plan V4 Final

Publication Date: October 2024

Project code: COL202-195

# About WRAP

**WRAP is a climate action NGO working around the globe to tackle the causes of the climate crisis and give the planet a sustainable future.**

**Our core purpose is to help you tackle climate change and protect our planet by changing the way things are produced, consumed, and disposed of.**

**Document reference: WRAP Cymru, 2023, Cardiff, Noise Impact Assessment and Noise Management Plan, Prepared by SLR Consulting Ltd.**

**Written by:** SLR Consulting Ltd

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# Acknowledgements

The content of this Report has been based upon information provided by WRAP Cymru and Pembrokeshire County Council.

# Glossary

| Term | Description |
|---|---|
| dB (decibel) | The scale on which sound pressure level is expressed. It is defined as 20 times the logarithm of the ratio of the root-mean-square pressure of the sound and a reference pressure (2x10-5 Pa). |
| dB(A) | A-weighted decibel. This is a measure of the overall level of sound across the audible spectrum with a frequency weighting (i.e. 'A' weighting) to compensate for the varying sensitivity of the human ear to sound at different frequencies. |
| Frequency Octave bands (and Third Octave bands) | Sound can occur over a range of frequencies extending from the very low, such as the rumble of thunder, up to the very high such as the crash of cymbals. Sound is generally described over the frequency range from 63 Hz to 4000 Hz (4 kHz). This is roughly equal to the range of frequencies on a piano.<br>Frequency is often divided into ('first') octave bands for analysis, with the range above considered within 7 octave bands with centre frequencies at 63 Hz, 125 Hz, 250 Hz, 1 kHz, 2 kHz and 4 kHz.<br>'Third' octave bands split this further into smaller frequency bands. This is typically only referenced in assessment of tonality of a noise source by identifying peaks (tones) in the frequency spectrum, i.e. when applying a rating penalty for tonality within a BS 4142:2014 assessment. |
| $L_{Aeq}$ | $L_{Aeq}$ is defined as the notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period. |
| $L_{A10}$ & $L_{A90}$ | If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time. Hence $L_{A10}$ is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, $L_{A90}$ is the 'average minimum level' and is often used to describe the background noise. It is common practice to use the $L_{A10}$ index to describe traffic noise. The 'A' in the notation indicates a single weighted figure using the 'A' weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies. |

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|---|---|
| $L_{AFmax}$ | $L_{AFmax}$ is the maximum A-weighted sound pressure level recorded over the period stated. $L_{AFmax}$ is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the overall $L_{Aeq}$ noise level but will still affect the noise environment. Unless described otherwise, it is measured using a 'fast' response. |
| Sound pressure level (SPL) | Represents a noise level that can be measured directly, the result of pressure variations in the air achieved by the sound waves, on a dB scale. |

# 1.0 Non-technical Summary

A Noise Impact Assessment and Noise Management Plan have been undertaken for the proposed new Pembrokeshire County Council Eco Park in Milford Haven. The Noise Impact Assessment and Noise Management Plan are required as part of an Environmental Permit Application to Natural Resources Wales (NRW) (application no. PAN-022050).

The Noise Impact Assessment has been undertaken with reference to British Standard 4142:2014+A1:2019 and NRW guidance document *Noise and vibration management: environmental permits.*

The assessment is an updated version of the previously submitted report (ref. 416.00798.00039 Pembrokeshire County Council Eco-Park, Noise Impact assessment and Noise Management Plan V3, August 2024). Version 3 of the report, along with Version 2, included noise mitigation measures (such as barriers) in order to reduce the noise impact.

This report has been updated following comments received from NRW, within the Schedule 5 Notice issued 10th September 2024, and proposes further noise mitigation measures.

An initial assessment has been undertaken based on the preliminary identified operational procedures for the site. The results of the initial assessment have been used to identify the dominant sources, and target mitigation measures to minimise noise at noise sensitive receptors.

The identified targeted measures to be implemented at the site (in addition to appropriate measures already identified and included for implementation, as detailed within the Noise Management Plan) are summarised in Table 1-1.

**Table 1-1:** Additonal Noise Mitigation Measures Proposed

| Mitigation Measure | Details |
|---|---|
| Restriction on building door opening | Phase 1 building: A maximum of 2 doors on the northern facade will be operational, for up to 25% of the time.<br><br>Phase 3 building: A maximum of 2 doors will be operational, for up to 50% of the time. Doors to be opened to a maximum of 5m height. |
| Move glass tipping and bulking (herein referred to as glass operations), into the Phase 3 building. | Phase 3 external glass operations will be moved to within the Phase 3 building.<br><br>Vehicles will tip inside the building, and doors will be closed (as above- it is assumed that doors will be closed 50% of the time). |

A Mitigated Assessment has then been undertaken to include the identified mitigation measures summarised in Table 1-1. The results show that the implementation of the measures will reduce the risk of adverse effects from noise generated by the site at sensitive receptor locations.

In summary, the updated assessment has found that, with the specified mitigation:

- The assessment concludes that the noise impact from the proposed operations at the Site at NSR01 and NSR05, meets the criteria for 'Audible or detectable noise' as defined by NRW. This indicates that noise pollution is being (or is likely to be) caused at a receptor. However, with the implementation of appropriate measures to prevent or minimise noise, the Site will remain compliant.
- Given the mitigation measures designed in, the contextual issues, and the fact that sound levels remain below WHO guidelines for outdoor areas, the noise impact aligns with the 'adverse impact' descriptor of BS 4142. This confirms that NRWs requirements for 'Audible or detectable noise' are met, provided measures are rigorously demonstrated and implemented.
- At all remaining receptor locations, the noise impact aligns with the 'low impact' descriptor of BS 4142, it is expected that sound from the Site will not be audible, or will be barely audible/detectable. This indicates that the impact at these locations will either not be perceptible or will be so minimal that it does not impact the overall acoustic environment.

## NRW Schedule 5 Notice

The report has been updated following comments received from NRW, within the Schedule 5 Notice issued 10th September 2024. With regard to the comments made by NRW on the previously submitted report, Table 1-2 summarises these below, and identifies how and where in this updated report they have been considered.

**Table 1-2:** Summary of NRW Comments

| NRW Comment | How Considered within Updated Report |
|---|---|
| Section 5.6 of your report states that "*Glass unloading typically involves up to 25 tips during the afternoon period, with some days requiring additional tips during morning period, totalling up to 39 tips per day*."<br>Please provide further information relating to the glass operations on-site. Include details of the frequency/and duration of individual operations (sources named 'Glass Dump', 'WRC Glass Container, 'Glass Bulking' in the model) and the associated impacts at the receptors for each individual operation in isolation. Provide information regarding sound levels over the assessment period in isolation. Provide information regarding sound levels over the reference assessment period ($L_{Aeq}$) and as a maximum ($L_{Amax}$) for each source. | Section 6.3.3 of the report includes information relating to glass operations in Phase 3 of the Site.<br><br>Section 6.3.4 of this report provides further information relating to WRC Glass.<br><br>Sections 6.6 and 8.2 of this report includes information relating to maximum ($L_{Amax}$) sound levels. |

| | |
|---|---|
| In the submitted modelling the partial breakdown of the predicted level at NSR05 indicates the dominant source over the assessment period to be sound from the main building. Please provide further information as to how the sound power levels have been obtained for the main building, please include details, such as, why 85d has been used for the internal sound pressure level for the building and if this is reasonable. Also provide further information about the methodology used to convert this figure into sound power levels in the submitted noise modelling software for the open door. Please refer to the model developer guidance if necessary. | Section 6.3.1 includes new information relating to the assumed internal reverberant sound level of the Phase 1 main building and further detail as to how this has been included within the noise model.<br><br>It is noted that the model has been amended to include a "K0 w/o Ground" correction of 0 for building façade area sources (as they are vertical radiating sources, i.e. no reflection from the facades, and reflection from the ground is already accounted for within the model calculations). The previous iterations of the model included a correction of 3.<br><br>Appendix 3 details the measured operational sound levels which has been used in the assessment. |
| As one of the dominant noise sources on site, provide details explaining the requirement for the main building doors to be open 100% of the time during operation. | Doors open 100% of the time were included as part of the operational procedures for the site, partly relating to Health and Safety procedures and were based on operations at other sites.<br><br>However, the practicability of closing doors when not in use has subsequently been considered and the client has advised that doors can be closed when not in use. This is also detailed within Table 7-2.<br><br>Section 7.0 of this report includes details of this measure, and the assessment in Section 8.0 includes an assessment of doors which will be closed for a proportion of the time. |
| Please provide detailed information showing how mitigation measures or operational controls will reduce the predicted impact at NSR05. This should be quantified. As explained in our guidance, we expect your NIA to include the following information in this section:<br><br>- Rank the identified noise sources on site from highest to lowest (based on level of impact at each receptor). | Section 7.0 details the proposed mitigation measures and Section 8.0 includes an assessment of the measures.<br><br>Section 7.1 and 8.2 details the ranking of noise sources.<br><br>Section 7.2 and 8.2, detail the dominant sources before and after mitigation measures, and the decibel reductions achieved, and specifically includes Table 8-2 |

| | |
|---|---|
| - Target the dominant noise source with appropriate noise control measures that will prevent or minimise noise at the receptors.<br><br>- Quantify the noise control options in decibels, so you can achieve a noise control target based on the noise impact assessment. | Section 7.3 detailed the mitigation measures which have been considered for inclusion within the site design, and have been included or excluded for the reasons set out.<br><br>Section 8.3 shows how maximum sound levels will be significantly reduced by the mitigation measures. |

# 2.0 Introduction

The Waste and Resource Action Programme (WRAP), on behalf of Pembrokeshire County Council (PCC) has retained SLR Consulting Limited (SLR) to undertake a Noise Impact Assessment (NIA) and Noise Management Plan (NMP) for the proposed new Pembrokeshire County Council Eco Park in Milford Haven. The Eco Park will consist of a Waste Transfer Station (WTS) and a Waste and Recycling Centre (WRC). The NIA and NMP are required as part of an Environmental Permit Application to Natural Resources Wales (NRW).

The format of this report is based on the requirements presented within the NRW guidance document *Noise and vibration management: environmental permits* and has been undertaken to the guidance carried out in British Standard 4142:2014+A1:2019, *Methods for rating and assessing industrial and commercial sound*. This standard is intended to be used to assess the potential impact of sound (of an industrial or commercial nature) at noise-sensitive receptors within the context of the existing noise environment.

Whilst reasonable effort has been made to ensure that this report is easy to understand, it is necessarily technical in nature and a glossary of terminology is included.

Table 2-1 below details the SLR Acoustic Team members that have worked on the Project.

**Table 2-1:** SLR Acoustic and Vibration Team Members

| Name | Grade | Education | IOA Membership |
|---|---|---|---|
| Michelle Dawson | Technical Director | • Post Graduate Diploma in Acoustics and Noise Control (2009)<br>• MSc Environmental Assessment (2001 Sheffield University)<br>• BSc Geography (2000 Sheffield University) | Corporate Member of the Institute of Acoustics (MIOA) |
| Rosie James | Principal Acoustic Consultant | • I.O.A Certificate of Competence in Environmental Noise Measurement (University of Birmingham)<br>• BSc Environmental Studies University of Sunderland | Practitioner member of the Institute of Environmental Management and Assessment P.I.E.M.A |
| James Burchell | Associate Acoustic Consultant | • Post Graduate Diploma in Acoustics | Corporate Member of the Institute of Acoustics (MIOA) |

| | | | |
|---|---|---|---|
| | | and Noise Control (2014)<br>• BSc Audio and Recording Technology | |
| Miriam Pratap | Associate Acoustic Consultant | • Sound, Light and Live Event Technology, University of Derby (2016) | Corporate Member of the Institute of Acoustics (MIOA) |
| Nick Auckland | Associate Acoustic Consultant | • Post Graduate Diploma in Acoustics and Noise Control (2012)<br>• BSc Audio and Recording Technology | Corporate Member of the Institute of Acoustics (MIOA) |

# 3.0 Guidance and Standards

## 3.1 Noise and vibration management: environmental permits

NRW, the Environment Agency, Scottish Environment Protection Agency and Northern Ireland Environment Agency produced *Noise and vibration management: environmental permits* (NVM) guidance in January 2022 to help holders and potential holders of permits apply for, vary, and comply with their permits. The guidance replaced the *Horizontal Guidance for Noise* (H3) parts 1 and 2.

The NVM details when a noise assessment is required, the competency required to undertake an assessment and how to carry out a noise impact assessment, and references BS 4142 as the appropriate assessment methodology.

The NVM outlines how context should be taken into account in the assessment and notes that *"Whilst context allows you to interpret impact thresholds (to a degree), there are practical limits to the extent of the interpretation. It is unlikely you could adjust the assessment outcome beyond the next band (for example, modifying a BS 4142 outcome of more than 10dB to be less than an 'adverse impact')."*

Determining the outcome of the assessment the following should be considered:

- weekdays rather than weekends.
- what the sound 'means' – meaningful sound is one that conveys an unpleasant meaning beyond its mere acoustic content, for example noise from an abattoir.
- time of day.
- the absolute sound level.
- where the sound occurs.
- new industry or new residences.
- intrinsic links between the source and receptor, for example the source is the resident's place of work.
- local attitudes.
- the residual acoustic environment.
- the land use at the receptor (for example, gardens rather than yards).
- the exceedance (traditional BS 4142).
- whatever else might be particular to that individual situation.

Based on the results of the BS 4142 assessment the NVM has three distinct requirements as detailed in Table 3-1.

**Table 3-1:** NVM Assessment

| NVM Result | BS 4142 Descriptor | Next Stage |
|---|---|---|
| Unacceptable level of audible or detectable noise | The closest corresponding BS 4142 descriptor is 'significant adverse impact' | You must take further action or you may have to reduce or stop operations. The environment agencies will not issue a permit if you are likely to be operating at this level. |
| Audible or detectable noise | The closest corresponding BS 4142 descriptor is 'adverse impact' | Your duty is to use appropriate measures to prevent or, where that is not practicable, minimise noise. You are not in breach if you are using appropriate measures. But you will need to rigorously demonstrate that you are using appropriate measures. |
| No noise, or barely audible or detectable noise | The closest corresponding BS 4142 descriptor is 'low impact or no impact' | Low impact does not mean there is no pollution. However, if you have correctly assessed it as low impact under BS 4142, the environment agencies may decide that taking action to minimise noise is a low priority. |

## 3.2 British Standard BS 4142:2014+A1:2019

The assessment of impact contained in BS 4142:2014+A1:2019 (BS 4142), is undertaken by comparing the sound rating level, i.e. the specific level of the source plus any acoustic feature corrections, to the measured representative background sound level outside the sensitive receptor location.

In accordance with BS 4142, the significance of an industrial or commercial sound source depends on both the margin by which the rating level exceeds the background sound level and the context in which the sound occurs. It is therefore essential to place the sound in context, as an "*effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs".*

BS 4142 (Section 3) provides the following definitions:

- Ambient Sound: Totally encompassing sound in a given situation at a given time, usually composed of sound from many sources near and far. *NOTE: The ambient sound comprises the residual sound and the specific sound when present*.
- Ambient Sound Level, La = $L_{Aeq,T}$: Equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T. *NOTE: The ambient sound level is a measure of the residual sound and the specific sound when present*.

- Background Sound Level, $L_{A90,T}$: A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given interval, T, measured using time weighting F and quoted to the nearest whole number of decibels (dB).
- Rating Level, $L_{AR,Tr}$: Specific sound level plus any adjustment for the characteristic features of the sound.
- Residual Sound: Ambient sound remaining at the assessment location when the specific sound source is supressed to such a degree that it does not contribute to the ambient sound.
- Residual Sound Level, $L_r = L_{Aeq,T}$: Equivalent continuous A-weighted sound pressure level of the residual sound at the assessment location over a given time interval, T.
- Specific Sound Level, $L_s = L_{Aeq,T}$: Equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T.
- Specific Sound Source: Sound source being assessed.

To account for the acoustic character of sound sources, BS 4142 states that penalties should be applied with respect to "*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".*

In this respect, the acoustic 'character' of a specific sound can be described using the following definitions from BS 4142:

- Tonality – "For sound ranging from not tonal to predominantly tonal the Joint Nordic Method gives a correction of between 0dB and +6dB for tonality. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4dB where it is clearly perceptible and 6dB where it is highly perceptible".
- Impulsivity – "A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of 3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible".
- Intermittency – "When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied".
- Other Sound Characteristics – "Where the specific sound features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied."

BS 4142 defines the impact of the specific sound level by subtracting the measures background sound level from the rating level. This assessment is detailed in Table 3-2 and is reproduced from Section 11 of BS 4142 where it states: "*Typically, the greater this difference, the greater the magnitude of impact."*

**Table 3-2:** BS 4142 Assessment of Impacts

| Rating Level minus Background Sound Level | Assessment of Impacts |
|---|---|
| Around +10dB or more | A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context. |
| Around +5dB | A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context. |

In addition, BS 4142:2014:A1:2019 states:
*"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."*

BS 4142 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

BS 4142 also notes that *"adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact"*. Finally, BS 4142 outlines guidance for the consideration of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

# 4.0 Site Description

PCC propose to develop a multi-faceted Eco Park to support its county-wide collection service implementing the Welsh Government Blueprint. Additionally, the new site location will allow the vehicle fleet to be relocated, reducing current waste mileage, and increasing productivity although this will be outside of the Environmental Permit boundary.

The development consists of four phases as detailed below. Phases 1-3 have been commissioned first, followed by Phase 4.

- Phase 1 – recycling transfer facility and associated access roads. This phase will also contain an office and visitor centre, offering the opportunity for groups to come learn about waste and recycling;
- Phase 2 – vehicle and staff parking area. A vehicle maintenance workshop and staff welfare facilities are also planned as part of this phase;
- Phase 3 – residual waste and recycling facility; and
- Phase 4 – publicly accessible Waste & Recycling Centre (WRC).

Phases 1 and 3 make up the WTS, whilst Phase 4 consists of the WRC. Phase 2 does not consist of any waste activities, and therefore is not included within the EP boundary.

To assist in minimising noise emissions from the site, and prevent the generation of noise by good design, a 3m high acoustic barrier has now been constructed along the northern site boundary, along with a 3m high acoustic barrier at the western side of the Phase 3 covered bay, as shown on Drawings 004 and 005.

The site is situated approximately 3km northwest of Milford Haven and approximately 8km south west of Haverfordwest. The National Grid Reference (NGR) for the site is SM 88985 09338.

The area to the north of the site consists predominantly of open/agricultural land and commercial/industrial premises associated with Puma Energy are located immediately to the south and west.

Pembrokeshire Coast National Park lies approximately 50m from parts of the site's northern boundary and extends to the north and west. An individual residential property (holiday let property – human receptor) lies approximately 80m north of the EP boundary and further residential and farm/agricultural buildings are located approximately 100m north of the EP boundary.

The nearby residential properties to the site are identified as Noise-Sensitive Receptors (NSRs) and are detailed in Table 4-1 below. The locations of the NSRs are illustrated in Figure 4-1 below.

Further information regarding the NSRs, and the assessment location at each property is detailed in Section 6.4.

**Table 4-1:** Noise Sensitive Receptors

| NSR ID | NSR Name and Description | Property Co-Ordinates | Approximate Distance to Site Plant (m) |
|---|---|---|---|
| NSR01 | Upper Robeston Farm, residential property to the north of the Site, located between Robeston Cross and Robeston West (SA73 3TL). Representative of the of properties in Robeston West including Lawn View and Little Welsh Wood. | 188767, 209482 | 200 |
| NSR02 | Thornhill, residential property located to the north-east of the Site (SA73 3TN). | 189519, 209815 | 600 |
| NSR03 | Woodson, residential property located in Lower Thornton (SA73 3UQ), to the east of the Site. | 190344, 209103 | 1100 |
| NSR04 | Rickeston Water, residential property located in Rickeston (SA73 3TJ), to the west of the Site. | 187795, 209368 | 1100 |
| NSR05 | Residential property (used as holiday let) at Robeston Cross, to the north of the Site. | 188894, 209465 | 80 |

**Figure 4-1:** Noise Sensitive Receptors (NSR) and Monitoring Positions (MP)


# 4.1 Description of Operations

Proposed operations at the site will be to accept and process up to 74,999 tonnes per annum (tpa) of non-hazardous, hazardous wastes arising from household and commercial premises. Waste will be delivered to the site in local authority and commercial vehicles or delivered directly to the WRC by members of the public and commercial businesses.

The site will host a number of supporting ancillary services, namely HGV parking, a garage for routine and minor repairs, vehicle washing facilities, an education centre, and office accommodation. A satellite garage and workshop facility will be located on site (Phase 2) to deal with routine checks, inspections, and minor maintenance to support the fleet of waste vehicles and plant which will be based and operate from the site. All major maintenance activities will be delivered from the separately permitted Thornton Depot. Vehicles operating from the site will be able to re-fuel on site from a dedicated fuelling area. On site facilities for vehicle washing will also be provided. Whilst the ancillary services described are located on site, they do not constitute waste operations, and are therefore not included within the EP boundary.

PCC's fleet of waste collection vehicles will operate from the site, with parking provided to allow drivers and operatives to park whilst out on waste vehicles. On returning to site at the end of each shift, vehicles may need to be re-fuelled and washed. Again, these facilities are located outside of the EP boundary.

All vehicles, including HGVs, will access the site via the roundabout to the south. The gate to the north is designated for emergency use only and does not serve as a regular entry point for vehicles.

The site layout is illustrated on Drawings 003, 004, and 005.

# 5.0 Noise Survey

A baseline noise survey was undertaken between Thursday 14th and Monday 25th October 2021, to determine the prevailing acoustic environment at the nearby NSRs.

## 5.1 Survey Locations

The survey locations, which are representative of the closest NSRs are presented in Table 5-1. A plan showing the measurement positions (MP) of the sound surveys and nearby NSRs, is provided in Figure 4-1 above.

Photographs of the monitoring equipment in-situ are included as Figures 9-1 to 9-4 of Appendix 01.

It should be noted that the sound level meter at MP3 went off-line on the 22nd October 2021, and MP4 went off-line on the 19th October 2021, both due to battery failure. Calibration of the meters was found to have no signification drift therefore data has been deemed suitable for use in the assessment.

**Table 5-5-1:** Measurement Positions

| MP ID | Receptor | Description | MP Co-Ordinates |
|---|---|---|---|
| MP1 | NSR01<br>+<br>NSR05 | Located to the north-west of the Site in the field adjacent to NSR01, and of NSR05.<br>Baseline sound levels at this position, are also considered representative of NSR05 (located 130m east of MP1), and is considered to provide a robust scenario as NSR05 is located adjacent to the road, meaning baseline sound levels could be marginally higher than NSR01. | 188809, 209475 |
| MP2 | NSR02 | Located to the north-east of the Site. | 189519, 209815 |
| MP3 | NSR03 | Located to the east of the Site. | 190410, 209109 |
| MP4 | NSR04 | Located to the west of the Site. | 187795, 209368 |

## 5.2 Survey Equipment

The noise survey was undertaken using the equipment listed in Table 5-2. The sound level meters were field- calibrated before and after the survey using an acoustic calibrator. No significant drifts were observed, and the data was signed off by the surveyor as such, i.e. the drift observed was less than 0.2dB.

The calibration chain is traceable via the United Kingdom Accreditation Service to national standards held at the National Physical Laboratory. In accordance with BS 4142 the sound level

meters were laboratory calibrated within 2 years and the calibrators within 1 year. Calibration certificates for all of the equipment are available on request.

**Table 5-2:** Survey Equipment

| Survey Location | Equipment | Serial Number | Calibration Date |
|---|---|---|---|
| MP1 | Rion NL52 Class 1 Sound Level Meter<br>Rion NC-74 Acoustic Calibrator | 00331823<br>34336013 | 23/09/2022<br>04/10/2023 |
| MP2 | Rion NL52 Class 1 Sound Level Meter<br>Rion NC-74 Acoustic Calibrator | 00976174<br>34478298 | 02/03/2023<br>21/10/2022 |
| MP3 | Cirrus CR:171B Class 1 Sound Level Meter<br>Cirrus CR:515 Acoustic Calibrator | G061094<br>72210 | 23/01/2023<br>09/03/2023 |
| MP4 | Cirrus CR:171B Class 1 Sound Level Meter<br>Cirrus CR:515 Acoustic Calibrator | G079816<br>81268 | 31/01/2023<br>18/05/2023 |

The microphone at each location was placed at 1.5m above the ground in free-field conditions, i.e. at least 3.5m from the nearest vertical reflecting surface.

## 5.3 Noise Level Parameters

Measurements at each location were logged every 15 minutes and the following noise level indices were recorded:

- $L_{Aeq,T}$: The A-weighted equivalent continuous noise level over the measurement period, T.
- $L_{A90}$: The A-weighed noise level exceeded for 90% of the measurement period. This parameter is often used to describe background noise.
- $L_{A10}$: The A-weighted noise level exceeded for 10% of the measurement period. This parameter is often used to describe road traffic noise.
- $L_{AFmax}$: The maximum A-weighted noise level during the measurement period.

## 5.4 Weather Conditions

Details of weather conditions were captured throughout the survey via a Davis VantageVue weather station installed at MP1. Figure 5-1 illustrates the weather conditions monitored during the noise survey, where it can be seen that the air temperature remains above 5°C, wind speeds below 5 m/s and no rain for the duration of the survey. These conditions are suitable for the determination of background sound levels in accordance with BS 4142.

**Figure 5-1:** Weather Conditions During Noise Survey

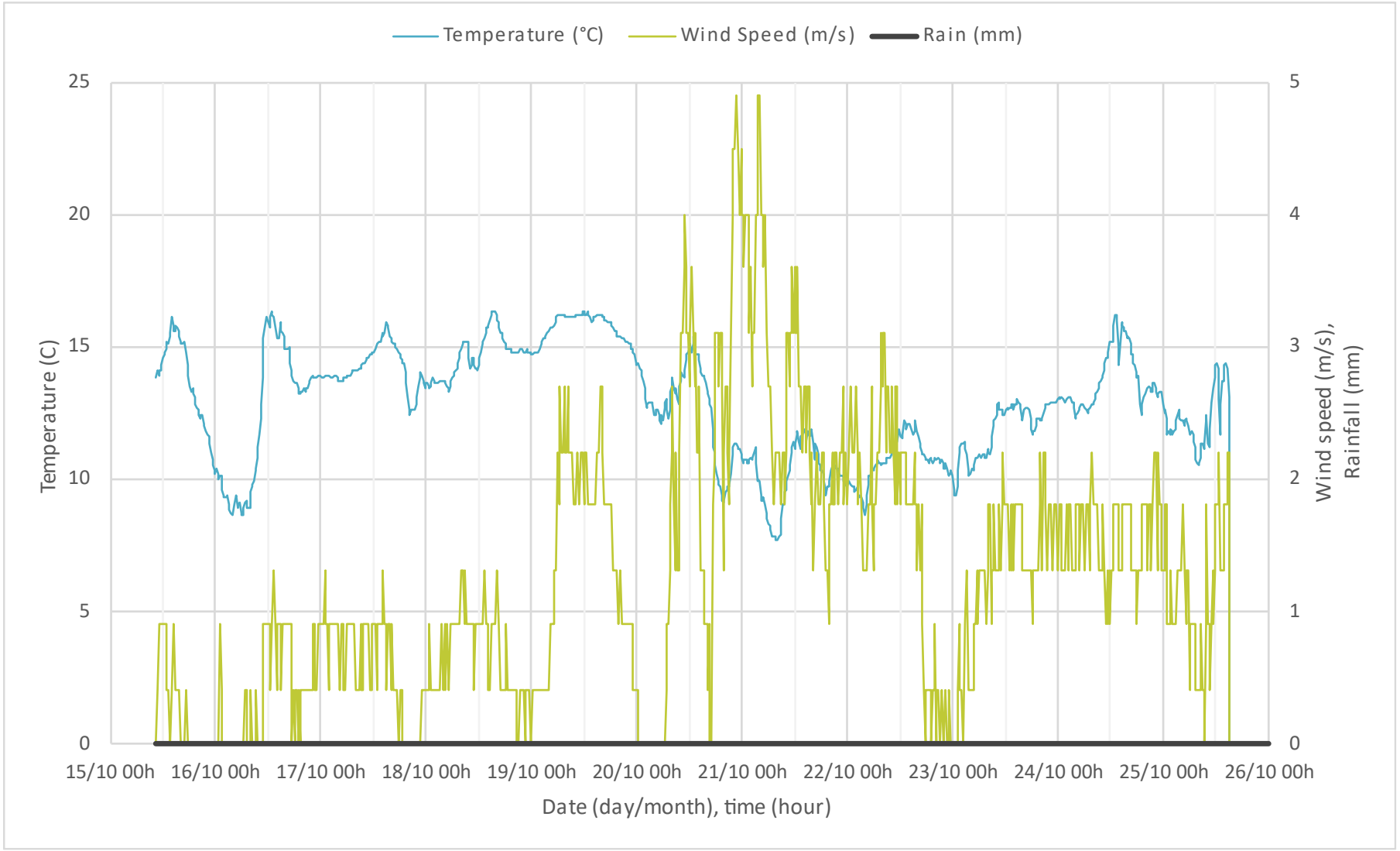
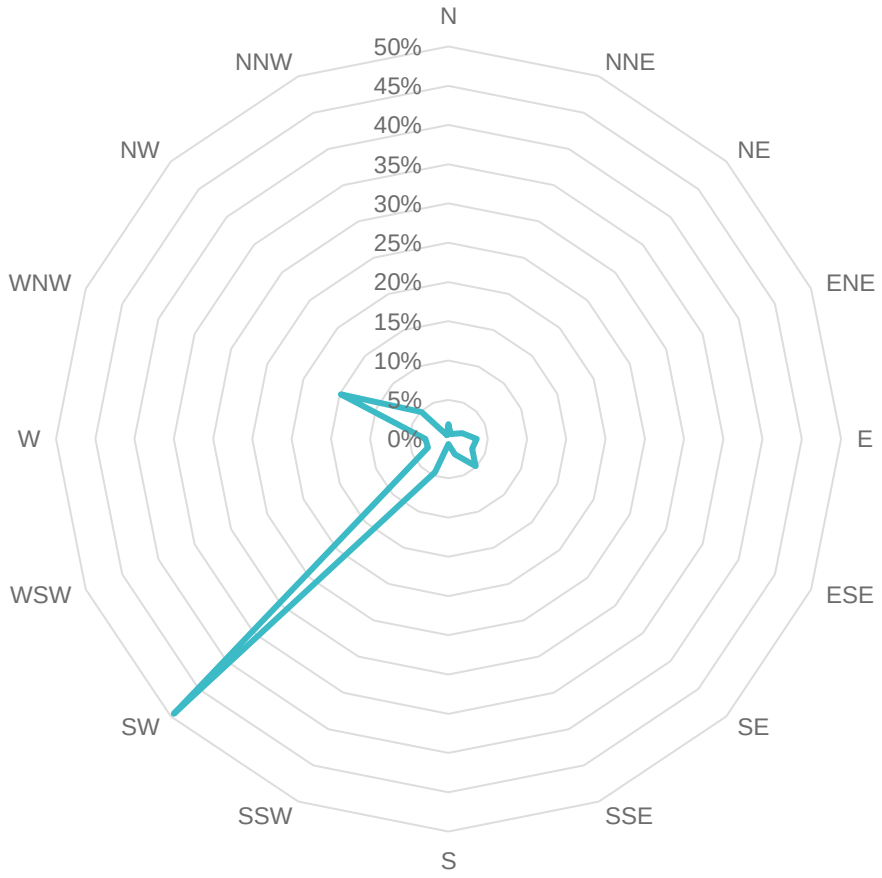


**Figure 5-2:** Predominant wind direction throughout the duration of the noise survey




# 5.5 Results

Analysis has been undertaken on the data captured at each of the monitoring locations to determine representative background sound levels during periods of the day and night.

For limited periods during the background sound survey ground investigation (GI) works were being undertaken across the Site. These were not occurring during equipment deployment and collection so are not referred to in the soundscape. As a precaution, any noise data measured during times when noisy equipment was being used for GI works has been excluded from the analysis. This is predominantly during times when a 9T tracked excavator was in use as follows:

- 18/10/21 0815 – 14:00 hours and 14:40 – 16:30 hours;
- 19/10/21 14:00 – 16:00 hours; and
- 20/10/21 11:00 – 16:00 hours.

## 5.5.1 Soundscape

During equipment installation and retrieval, details of the soundscape at each survey location were noted and are presented in Table 5-3.

**Table 5-3:** Details of Soundscape

| Location / Receptor | Soundscape |
|---|---|
| MSP1 / NSR01 + NSR05 | Generally tranquil with natural sound such as bird song, also noted low frequency hum from the oil refinery and distant road traffic noise. |
| MSP2 / NSR02 | Road traffic noise was noted to be the dominant source with traffic on the adjacent road flowing fairly constantly. Other natural noises noted here including wind disturbed vegetation, birds, and livestock nearby. |
| MSP3 / NSR03 | Quiet and tranquil rural location with agricultural and natural noises. Noises noted include distant tractors, bird song, stream water, occasional passing pedestrians, horses, and cars. |
| MSP4 / NSR04 | Distant road traffic noise and natural sounds such as wind in trees and birdsong. Occasional passing cars on the road in front of the house. |

## 5.5.2 Measured Noise Levels

A time-history plot of the measured sound levels at each of the survey locations MP1 to MP4 are presented in Appendix 02. Each plot includes ambient sound, using the $L_{Aeq}$, 15 min parameter, and background sound, using the $L_{A90}$, 15 min parameter. The number of occurrences of each integer background sound level is presented in Appendix 02 for MP1 to MP4, respectively, for the daytime operational hours (07:00 – 19:00) in accordance with BS 4142.

It is discussed in BS 4142 that there is no single background sound level for any given location, as this is a fluctuating parameter, which can be seen from the data presented in Appendix 02. However, assessment must be made using a representative value for background sound, which should not automatically be assumed to be either the minimum, mean average, or modal value.

Reviewing the statistical distribution of background sound levels presented in Figures 9-9 to 9-16 and considering the percentage of time the sound level falls above and below values, the background sound levels which are representative of the measurement positions are set out in Table 5-4 for the daytime period when the proposed development would be operational (0700 to 1900 hours).

**Table 5-4:** Representative Background Sound Levels, dB

| Receptor | Derived Background Sound Level Daytime 0700 – 1900 hours, $L_{A90, 15\ min}$ |
|---|---|
| NSR01 | 35 |
| NSR02 | 37 |
| NSR03 | 32 |

| | |
|---|---|
| NSR04 | 34 |
| NSR05 | 35 |

Table 5-4 presents the representative background sound level over the daytime period that the site will operate. As part of the assessment, the impact during the "peak" period when traffic movements to and from the site, are expected to be at their highest (as informed by the Transport Assessment produced by Capita, dated November 2021):

- Daytime: 14:00-15:00.

The most commonly occurring baseline background sound levels at each NSR during this period is detailed in Table 5-5 (see also graphs in Appendix 02).

**Table 5-5:** Measured Baseline Background Sound Levels During "Peak Hours"

| Receptor | Background Sound Level Daytime 1400 – 1500 hours, $L_{A90, 15\ min}$ |
|---|---|
| NSR01 | 37 |
| NSR02 | 38 |
| NSR03 | 34 |
| NSR04 | 36 |
| NSR05 | 37 |

# 6.0 Initial Assessment

The initial assessment presents the impact of sound from the Site at the closest receptors, and in the absence of mitigation measures.

## 6.1 Noise Model Assumptions

The sound predictions in this assessment have been undertaken using a proprietary software-based noise model, CadnaA, which implements the full range of UK calculation methods. The calculation algorithms set out in ISO 9613-2:1996 *Acoustics – Attenuation of sound during propagation outdoors – Part 2 General method of calculation* have been used and the model assumes:

- A ground absorption factor of 0.5 for mixed ground.
- Reflection factor of 2
- Downwind propagation between the source and the receiver.
- Receiver height of 1.5m during the daytime to reflect ground floor height.
- Attenuation predicted for 500Hz in accordance with ISO9613-2 when only A-weighted sound power levels known.

## 6.2 Operational Hours

The site's typical operating hours for the WTS and WRC areas, are as follows:

- WTS: Waste collections (via RRVs and CCVs) and ongoing haulage of transferred materials would typically be undertaken at the Site from 07:00 to 17:00, Monday to Friday. To ensure continuity of service, the Site would occasional be operational (and waste collections would be undertaken) on Saturdays and Sundays, public holidays and over the Christmas and New Year period (closed on Christmas Day, Boxing Day and New Years Day`); and
- WRC: Open to the public 7 days a week during the summer months (1st April to 31st October) and 5 days a week during the winter months from 8am to 6pm (closed on Christmas Day, Boxing Day and New Years Day). In order to maintain the site for public use, the site is serviced by vehicles and operatives between 6:30am and 8pm.

With regard to activities during the night-time, it has been confirmed that there will be no unloading operations conducted during this period. Instead, the only activity which would typically occur during the night-time assessment, is staff car parking, and the departure of empty HGVs at the start of the working day.

However, as advised by NRW, noise generated by these activities does not need to be considered as they will be outside of the EP boundary.

Therefore, operations during the night-time period (23:00 – 07:00), have been excluded from the assessment.

# 6.3 Noise Sources

The following plant and operating assumptions have been made for each Phase of the proposed development and all operations detailed within Section 4.1.

Plant and operating assumptions have been informed by discussions with PCC. An overview of noise sources can be seen in Table 6-1.

Abnormal Operations are not assessed as during abnormal operations it is likely that the sort line, baler, and conveyor (some of the noisiest operations at the site) would be off and there would be no compaction at the WRC. Therefore, during abnormal operations many of the noise sources listed in Table 6-1 would not be operating. The assessment presented is therefore considered robust.

**Table 6-1:** Model Noise Sources

| Noise Source | Coordinates | | Height (m) |
|---|---|---|---|
| | X (m) | Y (m) | |
| Glass Unloading | 189026.09 | 209300.12 | 1.00 |
| Wood Unloading | 189057.09 | 209282.93 | 2.00 |
| Metal Unloading | 189045.29 | 209288.33 | 2.00 |
| Tyre Unloading | 189035.55 | 209293.33 | 2.00 |
| Spare Unloading | 189068.40 | 209280.05 | 2.00 |
| | 189141.32 | 209353.39 | 2.00 |
| | 189133.06 | 209357.30 | 2.00 |
| | 189123.85 | 209360.91 | 2.00 |
| | 189114.22 | 209365.04 | 2.00 |
| | 189106.27 | 209368.64 | 2.00 |
| Household | 188935.18 | 209381.60 | 1.50 |
| Pressure Washer | 189057.23 | 209285.11 | 0.50 |
| WRC Compactor | 188953.10 | 209337.70 | 1.00 |
| WRC Glass Container | 188905.60 | 209374.62 | 0.20 |
| Glass Bulking | 189025.32 | 209297.75 | 2.00 |
| Transformer | 188990.75 | 209420.32 | 2.00 |
| Blower | 189067.87 | 209280.68 | 0.50 |
| WRC Compactor | 188944.82 | 209336.37 | 1.00 |
| Telehandler | 189120.34 | 209353.87 | 1.00 |
| Lifting Full Container | 189052.72 | 209299.86 | 1.00 |

| | | | |
|---|---|---|---|
| | 188940.95 | 209377.60 | 1.00 |
| Dropping Container | 188944.52 | 209377.60 | 1.00 |
| Metal Unloading | 188958.80 | 209373.49 | 2.00 |
| Cars Entering | 189007.98 | 209233.74 | 0.5 |
| Heavy Vehicle In/Out | 189156.30 | 209321.63 | 0.5 |
| | 189007.11 | 209232.91 | 0.5 |
| | 188959.66 | 209330.25 | 0.5 |
| | 189021.29 | 209219.52 | 0.5 |
| Loading Shovel | 189074.47 | 209285.10 | 0.5 |
| | 188922.33 | 209337.58 | 0.5 |
| | 189113.47 | 209265.61 | 0.5 |
| HGV to Load/Unload | 188924.97 | 209320.98 | 0.5 |
| Forklift | 189115.33 | 209354.48 | 0.5 |
| | 189125.86 | 209350.08 | 0.5 |
| HGV Unloading | 189069.93 | 209386.67 | 0.5 |
| HGV to Bay | 189035.10 | 209325.90 | 0.5 |

### 6.3.1 Phase 1

The Phase 1 building[1], will include following fixed plant will be utilised within the

- Sorting System, including:
  - Over band magnet
  - Eddy current separator
  - Floor infeed conveyors/hoppers/infeed systems
  - Infeed conveyors
  - Picking station with conveyor
- 2 no. balers:

[1] Phase 1 building corner coordinates:

| Corner | X | Y |
|---|---|---|
| Corner 1 | 189026.0 | 209340.0 |
| Corner 2 | 189157.0 | 209279.0 |
| Corner 3 | 189172.0 | 209313.0 |
| Corner 4 | 189040.0 | 209373.0 |

- 1 for cardboard and other bulk materials
- 1 for plastic, cans, and cartons – CKTR82 – 80T Twin ram baler

At the time of writing, noise data for all the above sources is not available to enable input of individual sources to the Phase 1 building within the model. Instead, a reasonable assumption of the internal reverberant sound pressure level within the Phase 1 building has been based on operational noise surveys conducted by SLR at similar facilities.

As detailed within Appendix 3, measurements were undertaken at a similar waste facility, and an internal reverberant sound pressure level of 84 dB $L_{Aeq}$ (when in full operation, not accounting for intermittency) has been applied to area sources representing; the radiating facades, and roof of the Phase 1 building. A worst case on-time of 100% has been assumed.

The methodology used in the noise model to convert the internal sound pressure level into a sound power level for the doors, involves simulating an open door as vertical area sources. A sound transmission loss of 0 dB has been applied, which is considered a robust approach since an opening can directly transmit sound.

Furthermore, the model has been amended to include a "K0 w/o Ground" correction of 0, for the walls and door sources (as they are vertical radiating sources, i.e. no reflection from the facades, and reflection from the ground is already accounted for within the model calculations).

The sound power level for the entire area (PWL), and per unit area (PWL" 1m²) is calculated within the software, based on an "indoor level" of 84 dB. As noted in the developer guidance "this option enables to specify the radiated sound power based on the (diffuse) interior level SPL".

The sound reduction indices of the facades have been assumed to be Rw 26dB based upon low-performance lightweight cladding for the external wall and roof. The initial model is based on two fully open doors on the northern façade and one at the southern facade (7m high), which are open 100% of the time, as a worst-case scenario. Open doors and louvres have also been input to the model as area sources but with no sound reduction applied.

Using the above data inputs, the CadnaA software has calculated the sound power level per unit ($m^2$) of each radiating area source.

Mobile plant associated with Phase 1 and Phase 3 is as follows:

- Loading shovel machine/telehandler (between Phase 1 and Phase 3);
  - JCB 542 70 telescopic wheeled loader, with 2.4m wide bucket
  - JCB 560 80
- Teletruck (external bays and inside buildings)
  - JCB teletrack 30
- Forklift (external bays and inside buildings)
  - Toyota 8FDJ35-67666
- Cleansing equipment

- Pressure washer Nilfisk MH5M
- Stihl BGA85 battery blower

- HGVs (forward)
- Unloading (external bays)

For Phase 1 external noise sources, the data in Table 6-2 has been used within the noise model.

**Table 6-2:** Phase 1 External Noise Sources

| Description | Sound Powel Level (dB LWA) | On-time/Number of Movements (per hour) |
|---|---|---|
| Loading Shovel | 101 | 5 movements |
| Forklift | 99 | 8 movements |
| Teletruck | 100 | 10 minutes |
| Pressure Washer | 96 | 10 minutes |
| Blower | 98 | 10 minutes |
| HGV | 91 | 62 (peak) 18 (average) movements |
| Unloading | 95 | 10 minutes |

### 6.3.2 Phase 2

No waste operations will be undertaken within the Phase 2 area of the site, and therefore this area is not included within the EP boundary, and no further noise assessment is required.

### 6.3.3 Phase 3

Phase 3 will comprise a residual waste building[2] and external covered waste bays. Bagged residual waste and bagged Absorbent Hygiene Products (AHPs)will be deposited in dedicated bays within the residual building at the WTS for bulking up, prior to onward transfer.

[2] Corner X Y
Corner 1 189085.0 209278.0
Corner 2 189138.0 209254.0
Corner 3 189125.0 209225.0
Corner 4 189072.0 209250.0

Plant that will be utilised within the Phase 3 building includes a loading shovel and HGVs. As per the Phase 1 building, an internal reverberant sound pressure level of 84 dB $L_{Aeq}$ has been assumed[3], and applied to area sources within the model, together with sound reduction of $R_w$ 26dB based upon low-performance lightweight cladding for the external wall and roof. Open doors and louvres have also been input to the model as area sources but with no sound reduction applied.

The model is based on three fully open doors on the northern façade (7m high), which are open 100% of the time, to reflect operational procedures as advised by the client.

Noise sources associated with the external covered waste bays are:

- Glass unloading
- Wood unloading
- Metal unloading
- Tyre unloading
- Spare unloading
- Glass Bulking
- HGV movements to and from covered bays
- Loading shovel – as detailed above in Phase 1

For unloading into the Phase 3 external covered bays, SLR has conducted measurements of noise levels produced from the unloading of various different materials. A point source sound power level of 95 dB $L_{WA}$ has been used as a worst-case level, for each bay/skip. Unloading typically lasts for only a few seconds each tip; as a reasonable worst-case a total of 10-minutes has been included in the hour for each area to account for this activity.

Glass unloading would typically take place when vehicles return to unload. Over the whole day this will involve up to 25 tips during the afternoon tipping period (a period encompassing approximately 3 hours), with some days requiring additional tips during the morning period, totalling up to 39 tips over the daytime tipping period (a period encompassing approximately 4 hours); an average of 10 tips per hour over the 4-hour tipping period. Unloads typically take up to 30 seconds but actual tipping of glass into the bay lasts only a few seconds each time. As a reasonable worst-case a total of 2-minutes has been included in the hour for each area to account for this activity.

For the Phase 3 external sound sources, the data in Table 6-3 have been used within the noise model.

**Table 6-3:** Phase 3 Noise Sources

| Description | Sound Power Level (dB LWA) | On-time/Number of Movements (per hour) |
|---|---|---|
| Glass unloading (assumed western-most bay) | 107 | 2 minutes |

[3] Based on measurements undertaken by SLR in 2024 within a recycling reception area at a similar facility (Crymlyn Burrows-SLR report 402.065200.00001).

| | | |
|---|---|---|
| Wood unloading | 95 | 10 minutes |
| Metal unloading | 95 | 10 minutes |
| Tyre unloading | 95 | 10 minutes |
| Spare unloading | 95 | 10 minutes |
| Glass Bulking (assumed western-most bay) | 124 | 2 minutes |
| Loading Shovel | 101 | 5 movements |
| HGV | 91 | 62 (peak)/18 (average) movements |
| HGV Reverse | 91 | 2.25 minutes |

### 6.3.4 Phase 4 – WRC

The WRC has been developed in line with that operated at Crane Cross WRC. The noise assessment for Crane Cross WRC (ref 002-UA004581-UE31-1 dated 31 March 2014 by Hyder) has been reviewed and the information used to model the proposed development. Table 7-7 of the Crane Cross WRC assessment presents the source noise levels from activities including percentage on-time and is recreated in Table 6-4 below.

**Table 6-4:** Noise Sources at 10m – WRC, dB

| Description | Number | % On Time | Plant Noise | |
|---|---|---|---|---|
| | | | $L_{Aeq,\ 1\ min}$ | $L_{Amax}$ |
| Skip Compactor | 2 | 5 | 65 | 86.3 |
| Glass Container being filled | 1 | 2 | 78.5 | 88.1 |

In addition to the above, noise sources associated with the WRC are:

- Loading shovel;
- Container lift and drop;
- Household unloading (including car movements); and

- HGV movements to and from skips.

For Phase 4 sound sources, the sound power levels in Table 6-5 have been used within the noise model.

**Table 6-5:** Phase 4 Noise Sources

| Description | Sound Power Level (dB $L_{WA}$) | On-time/Number of Movements (per hour) |
|---|---|---|
| Glass tipping (assumed western-most bay) | 107 | 1.5 minutes |
| Household unloading | 95 | 10 minutes |
| Loading shovel | 101 | 2 movements |
| HGV | 91 | 10 (peak)/ 2 (average) movements |
| Container lift | 97.2 | 0.5 minutes per hour |
| Container drop | 99.4 | 0.5 minutes per hour |
| Skip compactors | 93 | 3 minutes per hour |
| Cars | 84 | 48 |

In addition to the above information associated with each phase, a transformer will be located within the northern area of the site, with an assumed power level of 81 dB. This sound power level is based on manufacturer's data relating to the proposed backup generator, which would only operate during exceptional circumstances (i.e. when no mains power is available and the transformer would therefore not be on). Manufacturer's information relating to the 100kVA transformer indicates a sound power level of 59 dB; the use of 81 dB is therefore considered robust.

Regarding the 'WRC Glass Container', it is anticipated to be used rarely by householders as they receive kerbside glass recycling collections. Additionally, it is expected that this facility will be used infrequently by smaller businesses as the majority of businesses receive trade waste collections.

It is assumed that tipping into the container will take place 2% of the time (based on Crane Cross WRC and shown in Table 6-4). An on-time of 2% in an hour equates to 72 seconds, which has been included as a slightly increased 1.5 minutes within the model. This is therefore considered to be a robust assumption based on the anticipated infrequent use.

**WRC Glass and Containers**

The WRC manages various materials with differing storage durations, before being taken off-site for processing. This summary focuses on the handling of WRC glass, and other materials stored in large containers which could cause impulsive sounds within the WRC. The list outlines the maximum storage times and removal schedules, which are expected at the Site and in compliance with storage limits.

WRC Glass

- Mixed Glass is stored in a 20 cu/yd skip for a maximum of 1 month, and the skip is expected to be replaced and taken off-site once every 2 weeks.

Containers

- Plasterboard is stored in a 40 cu/yd closed container for a maximum of 2 months. But the container is expected to be replaced and taken off-site once every 2 weeks.
- Paints are stored in a 20ft shipping container for a maximum of 3 months.
- Reusable Furniture and Non-reusable Furniture are stored in 20ft shipping containers for a maximum of 2 weeks.
- Mattresses are stored in a 20ft shipping container for a maximum of 2 weeks.
- Gas Bottles are stored in a cage for a maximum of 3 months.
- Inert Waste is stored in a 20 cu/yd skip, with a maximum storage time of 1 month and is anticipated to be taken away and replaced twice a week.

# 6.4 Receptor Locations

The specific sound levels have been predicted at all NSRs at a height of 1.5m above ground. Within the noise model, all the receptor locations (i.e. the point where sound levels are calculated) have been situated within the main outdoor amenity space.

With specific regard to NSR01, the selected receptor location has been selected as the outdoor patio area, on the eastern side of the property, which faces towards the Site.

At NSR05, the selected receptor location has been chosen as the outdoor patio area on the western side of the property and located close to the seating area in the southern part of the garden.

At NSR05, the selected receptor location is substantiated by the primary outdoor amenities present, notably the outdoor seating area and hot tub which are located on the western side of the property. This confirmation has been sourced from the holiday let listing for the property (named Catamouse), which offers insights into the external area predominantly used for amenity, which is on the western side.

Additionally, it should be noted that the outdoor amenity area on the eastern side of the property, directly overlooks the crossroads, with roads situated to the north and south. Therefore, placing the outdoor receptor location to the west accurately reflects potential noise impacts in the primary amenity area to the rear.

Similarly, at NSR01, the chosen outdoor receptor location is supported by the substantial outdoor amenity space which surrounds the entire property, including areas to the north and east. Additionally, it should be noted that property's dual function as a working farm (named Upper Robeston Farm) and for commercial operations under the name of From Our Farm, could potentially affect the perception of commercial noise.

Given these considerations, the selected receptor locations are deemed robust, accurately representing the probable receptor locations at each property.

# 6.5 Predicted Specific Sound Levels

The predicted specific sound levels are shown in Table 6-6 below and includes the 3m high acoustic barrier located along the northern site boundary, as denoted on Drawing 004 which accompanies the application.

It is noted that additional receivers have been input to the noise model to represent all dwellings at the southern edge of Robeston West (nearest the Site); the presented results for NSR05 are the highest predicted sound levels within Robeston West.

Predicted specific sound levels are shown for daytime average (07:00-19:00), and daytime peak (14:00-15:00) periods. As already noted, a night-time assessment has not been undertaken, as it is understood these operations are not included within the permit.

**Table 6-6:** Sounds Levels at Noise-Sensitive Receptors, dB(A), unmitigated level

| Receptor | Predicted Specific Sound Level $L_{Aeq,1hr}$ dB | |
|---|---|---|
| | Daytime (0700 – 1900) 'Average' | Daytime (1400 – 1500) 'Peak' |
| NSR01 | 36 | 36 |
| NSR02 | 31 | 31 |
| NSR03 | 23 | 23 |
| NSR04 | 21 | 21 |
| NSR05 | 39 | 39 |

# 6.6 Predicted Maximum Sound Levels

The most distinctive activity is likely to be glass tipping and bulking within the Phase 3 external covered bays. To provide information relating to LAmax,F sound levels at NSRs generated by the glass handling, a maximum sound power level of 140 dB has been assumed, and applied as a

point source within the external glass bay within the CadnaA model (x 189025.32, y 209297.75 at 2m height), to calculate the "maximum" level a 100% on-time has been used.

The predicted LAmax,F level at each NSR is shown in Table 6-7.

**Table 6-7:** Predicted $L_{Amax,F}$ Sound Pressure Levels- Glass Handling

| NSR | $L_{Amax,F}$ Sound Pressure Level, dB |
|---|---|
| NSR01 | 60 |
| NSR02 | 57 |
| NSR03 | 43 |
| NSR04 | 44 |
| NSR05 | 62 |

# 6.7 Acoustic Feature Corrections

BS 4142 acoustic feature corrections are applied to the specific sound level to determine the rating level. These corrections relate to the perception of the sound outdoors at the receptor location. Due to the relatively large separation distances between the noise generating activities and the receptor locations it is considered that determining potential corrections for individual activities is not required. Instead, the determination of corrections has been applied to the site as a whole.

A description of the corrections can be found in Section 2.0 of this report. Table 6-8 details the corrections to be applied to the specific sound level at the nearest noise-sensitive receptors.

**Table 6-8:** Character is Noise Source at Receptors

| Feature | Correction Range | Comment | Correction Applied |
|---|---|---|---|
| Tonal | 0 – 6dB | It is considered that tonal qualities would likely be associated with reversing alarms on external vehicles, however, based on the low specific sound contributions of these sources, once corrected for distance, in comparison to the background noise level, they are not considered perceptible enough at the NSR to accrue a correction. | 0dB |
| Impulsive | 0 – 9dB | There is the potential for impulsive noise to be clearly perceptible above the acoustic soundscape (i.e. during | 6dB |

| | | | |
|---|---|---|---|
| | | unloading events). This is discussed further in Section 6.7.1 below. | |
| Other Sound Characteristic | 0 – 3dB | The intermittency of HGVs and RCVs would be distinctive against the residual acoustic environment during early morning (night-time) period. | 0dB |
| Intermittency | 0 – 3dB | The general characteristics of the specific sound should not be significantly different or distinctive against the existing noise environment. Therefore, no correction has been applied. | 0dB |

### 6.7.1 Impulsivity

Impulsive sounds related to the loading and unloading of various materials, and other operations could be audible at the NSRs. However, sounds from glass operations are likely to be more perceptible and noticeable, due to the nature of the material. While good working practices can effectively manage the impacts of handling other materials, glass is inherently more challenging to control.

In relation to impulsivity, it is recommended to assess the perceived audibility of the predicted $L_{Amax,F}$ level during glass unloading events, by comparing it to the measured $L_{Amax,F}$ values of the residual sound. This method aligns with industry standards and best practices as outlined in BS 4142, which states:

*"The prominence of tonal or impulsive sound from a source can be masked by residual sound. In many cases, the amount of masking varies as the residual sound changes in level and possibly character. The source's tonal and/or impulsive characteristics could also vary with time."*

It's important to note that impulsive sound emissions from the site will vary in level and character, particularly during activities like glass unloading. These variations may arise from factors such as load weight and frequency (no. of events), leading to fluctuating sound levels that vary over time.

Glass unloading would typically involve up to 25 tips during the afternoon period, with some days requiring additional tips during the morning period, totalling up to 39 tips over the daytime period. Unloads typically take up to 30 seconds but actual tipping of glass into the bay lasts only a few seconds each time.

Given these factors and the local environmental context, impulsive sound may be detectable above the residual sound, and would likely be perceived as "clearly perceptible" in terms of impulsivity, Therefore, a 6dB correction is justified and considered robust.

## 6.8 BS 4142 Assessment (Unmitigated)

The corrections described in Table 6-8 above have been added to the predicted specific sound levels shown in Table 6-9 to derive the rating levels at each of the nearest noise-sensitive receptors.

The rating levels have then been compared to the derived background sound levels and assessed accordingly.

The initial results of the BS 4142 assessment are shown in Table 6-9 below.

**Table 6-9:** BS 4142 Assessment (Unmitigated)

| Receptor | | Period | Derived Background Level, $L_{A90, T}$ | Predicted Specific Level, $L_{Aeq,1h}$ | Predicted Rating Level, $L_{Ar, T}$ | Difference Between Rating and Background Level |
|---|---|---|---|---|---|---|
| NSR01 | | Daytime Average | 35 | 36 | 42 | +7 |
| | | Daytime Peak | 37 | 36 | 42 | +5 |
| NSR02 | | Daytime Average | 37 | 31 | 37 | 0 |
| | | Daytime Peak | 38 | 31 | 37 | -1 |
| NSR03 | | Daytime Average | 32 | 23 | 29 | -3 |
| | | Daytime Peak | 34 | 23 | 29 | -5 |
| NSR04 | | Daytime Average | 34 | 21 | 27 | -7 |
| | | Daytime Peak | 36 | 21 | 27 | -9 |
| NSR05 | | Daytime Average | 35 | 39 | 45 | +10 |
| | | Daytime Peak | 37 | 39 | 45 | +8 |

BS 4142 states:

> *"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. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the*

*sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context. Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level from the rating level."*

The initial results indicate that the rating level does not exceed the background sound level at NSR02, NSR03 and NSR04. BS 4142 states that 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 or significant adverse impact. Where the rating level does not exceed the background sound level, this indicates a low impact, depending on the context.

At NSR01, the initial results indicate that the rating level exceeds the background sound level by up to 7 dB. BS 4142 states that a difference of around +5 dB is likely to indicate an adverse impact, depending on the context.

The highest exceedance is at NSR05, where the rating level exceeds the background sound level by up to 10 dB. BS 4142 states that a difference of around +10 dB is likely to indicate a significant adverse impact, depending on the context.

### 6.8.1 NVM Assessment

With reference to the NVM requirements shown in Table 3-1, the NVM result, before consideration of specific noise management controls and the context in which the sound will occur, at NSR01 is, "*Audible or detectable noise*". NVM advises that, for this result, "*The closest corresponding BS 4142 descriptor is 'adverse impact'*".

At NSR05, the NVM result is, "*Unacceptable level of audible or detectable noise*". NVM advises that, for this result, "*You must take further action or you may have to reduce or stop operations. The environment agencies will not issue a permit if you are likely to be operating at this level*".

Consideration of specific noise control measures and the context in which the sound will occur, is discussed within subsequent sections of this report.

# 7.0 Noise Control Measures

Appropriate measures and industry best practice measures for the control of noise within the Site will be implemented. These measures are detailed in the following sub-sections, along with other site management procedures, with the specific aims of ensuring:

- Noise impacts are considered as part of all operations;
- The minimisation of the risk of unplanned 'noisy' events that could result in off-site complaints;
- Noise is primarily controlled at source by good operational practices, the correct use and maintenance of plant and operator training; and
- All appropriate measures are taken to prevent or, where that is not reasonably practicable, to minimise noise emanating from the site.

## 7.1 Ranking of Noise Sources

Following the assessment of noise impact in accordance with BS4142:2014+A1:2019 (as per Section 5.0), it has been possible to extract data from the noise model to 'rank' the on-site noise sources depending on their contribution to the specific sound level at each receptor[4] – as presented in Table 7-1. As each receptor is located at a different distance and direction from the site, the contributing noise sources will also be different depending on their relative position within the site. The noise sources have been ranked for average and peak day scenarios.

**Table 7-1:** Individual Sources at Receptors (Unmitigated)

| Receptor | Daytime- Average day<br>Noise Sources – with the highest contributions to Specific Sound Level $L_{Aeq,1hr}$ | Daytime- Peak hour<br>Noise Sources – with the highest contributions to Specific Sound Level $L_{Aeq,1hr}$ |
|---|---|---|
| NSR01- front | Door- Phase 3a 1 (28.0 dB)<br>Door- Phase 3a 2 (27.8 dB)<br>Door- Phase 3a 3 (27.2 dB)<br>Telehandler (26.3 dB)<br>Roof- Phase 1a (25.2 dB)<br>Metal tipping (25.1 dB)<br>Glass bulking (24.8 dB)<br>Roof – Phase 3a (20 dB) | Door- Phase 3a 1 (28.0 dB)<br>Door- Phase 3a 2 (27.8 dB)<br>Door- Phase 3a 3 (27.2 dB)<br>Telehandler (26.3 dB)<br>Roof- Phase 1a (25.2 dB)<br>Metal tipping (25.1 dB)<br>Glass bulking (24.8 dB)<br>Heavy Vehicle In (22.9 dB) |
| NSR02 | Door- Phase 1a 2 (25.5 dB)<br>Door - Phase 1a (25.0 dB)<br>Glass Bulking (22.5 dB)<br>Roof - Phase 1a (17.6 dB)<br>Wall - Phase 1a (14.9 dB)<br>Louvre north 6 (14.5 dB)<br>Louvre north 5 (14.2 dB)<br>Door - Phase 3a 3 (14.2 dB) | Door- Phase 1a 2 (25.5 dB)<br>Door - Phase 1a (25.0 dB)<br>Glass Bulking (22.5 dB)<br>Roof - Phase 1a (17.6 dB)<br>Wall - Phase 1a (14.9 dB)<br>Louvre north 6 (14.5 dB)<br>Louvre north 5 (14.2 dB)<br>Door - Phase 3a 3 (14.2 dB) |

[4] Dominant noise sources only, identified using the CadnaA 'partial level' function.

| | | |
|---|---|---|
| NSR03 | Door - Phase 1a 2 (16.5 dB)<br>Door - Phase 3a 2 (14.7 dB)<br>Door - Phase 3a 1 (14.4 dB)<br>Door - Phase 3a 3 (14.3 dB)<br>Door - Phase 1a (12.0 dB)<br>Roof - Phase 1a (9.9 dB)<br>Glass Bulking (8.2 dB)<br>Roof -Phase 3a (6.5 dB) | Door - Phase 1a 2 (16.5 dB)<br>Door - Phase 3a 2 (14.7 dB)<br>Door - Phase 3a 1 (14.4 dB)<br>Door - Phase 3a 3 (14.3 dB)<br>Door - Phase 1a (12.0 dB)<br>Roof - Phase 1a (10.0 dB)<br>Glass Bulking (8.2 dB)<br>Roof -Phase 3a (6.5 dB) |
| NSR04 | Door Phase 1a 3 (15.7 dB)<br>Roof - Phase 1a (10.2 dB)<br>Glass Bulking (9.4 dB)<br>Louvre South 1 (8.6 dB)<br>Louvre South 2 (8.4 dB)<br>Louvre South 3 (8.0 dB)<br>Metal tipping (7.8 dB)<br>Louvre South 4 (7.7 dB) | Door Phase 1a 3 (15.7 dB)<br>Roof - Phase 1a (10.2 dB)<br>Glass Bulking (9.4 dB)<br>Louvre South 1 (8.6 dB)<br>Louvre South 2 (8.4 dB)<br>Louvre South 3 (8.0 dB)<br>Metal tipping (7.8 dB)<br>Louvre South 4 (7.7 dB) |
| NSR05- rear | Door - Phase1a (34.8 dB)<br>Door Phase 1a 2 (30.4 dB)<br>WRC Glass container (26.7 dB)<br>Glass bulking (26.7 dB)<br>Roof - Phase 1a (26.7 dB)<br>Metal tipping (24.0 dB)<br>Wall - Phase 1a (22.7 dB)<br>Louvre north 1 (22.6 dB) | Door - Phase1a (34.8dB)<br>Door Phase 1a 2 (30.4dB)<br>WRC Glass container (26.7dB)<br>Glass bulking (26.7dB)<br>Roof - Phase 1a (26.7dB)<br>Heavy Vehicle in (25.7dB)<br>Metal tipping (24.0dB)<br>Wall - Phase 1a (22.7dB) |

## 7.2 Identification of the Dominant Sources

The sources with the highest contributions at NSR01 and NSR05, have been identified as the open doors of the Phase 1 and Phase 3 buildings. The consideration of mitigation has therefore focussed on these sources; however, consideration has also been given to other sources within the Noise Management Plan.

It is noted that, as an internal sound pressure level has been assumed and applied to buildings, individual internal items of plant cannot be identified and therefore have not been individually predicted and cannot therefore be 'ranked' in terms of their contribution to the specific sound level at each receptor.

Consideration has also been given to reducing $L_{Amax,F}$ sound levels from glass tipping and bulking within the Phase 3 external bay area.

## 7.3 Mitigation Measures

The mitigation measures detailed below in Table 7-2, have been considered for inclusion within the site design, and have been included or excluded for the reasons set out below.

**Table 7-2:** Noise Mitigation Options

| Mitigation Measure | Included / Excluded | Justification |
|---|---|---|
| Phase 1 building: Open Doors on northern façade.<br><br>Doors to be kept shut at all times during operation. | Excluded | Doors must remain open at times to allow vehicle entry and exit. For Health and Safety reasons, at least two operational doors are needed to enable a one-way system. |
| Phase 1 building: Open Doors on northern facade<br><br>Two doors used, which are to be kept shut when not being used by a vehicle, i.e. closed for some of the time. | Included | Doors will be closed when not frequently used by vehicles, limiting opening times to a maximum of 15 minutes (25%) per hour. Fast-acting doors may be required to achieve this, selected to match the sound reduction performance of the façade. |
| Phase 3 building: Open Doors<br><br>Doors to be kept shut at all times during operation. | Excluded | Doors must be open at times to facilitate vehicle entry and exit. At least two operational doors are required for a one-way system, necessary for Health and Safety compliance. |
| Phase 3: Glass operations in external bay<br><br>Relocation of glass operations (i.e. tipping and bulking) inside Phase 3 building. | Included | Glass operations will be relocated from the external bay to the residual waste building, where glass will tipped internally. |
| Phase 3 building: Open Doors<br><br>Two doors used, which are to be kept shut when not being used by a vehicle, i.e. closed for some of the time.<br><br>Additionally, doors to be kept shut during glass operations to enclose noise. | Included | Doors will remain closed when not required for vehicle access and during glass operations to control maximum levels ($L_{Amax,F}$).<br><br>At least two operational doors are necessary for a one-way vehicle system. Doors will be open for no more than 30 minutes (50%) per hour, to control specific noise levels ($L_{Aeq,T}$). Fast-acting doors may be necessary, selected to provide similar sound reduction to the façade. |

# 7.4 Mitigated Noise Model

Following the consideration of noise mitigation measures which can be implemented within the Site design, the noise model has been updated to show the mitigated specific level at each receptor.

The noise model has therefore been updated based on the following:

- The Phase 1 main building doors will be closed when not being used by vehicles. Doors can be open for no more than 15 minutes (25%) within an hour.
- Glass operations will be moved inside the Phase 3 residual waste building. The following has been taken into account for this move of glass operations:
    - Based on SLR measurements undertaken at a similar waste facility[5] with glass tipping and bulking activities occurring, an internal reverberant sound pressure level of 86 dB $L_{Aeq}$ (when in full operation, not accounting for intermittency) has been applied to area sources representing; the radiating facades, and roof of the Phase 1 building. An on-time of 100% has been assumed (as averaged over the hour period).
    - Initially three doors were open, following a review of operations this has been reduced to two opening doors  to allow to entry and exit of vehicles via a one-way system (for health and safety reasons). However, doors will be closed during glass operations (to control LAmax,F levels) and must be open for no more than 30 minutes (50%) within an hour (to control specific levels).

[5] Based on measurements undertaken by SLR in 2024 within a recycling reception area at a similar facility (Crymlyn Burrows-SLR report 402.065200.00001). General ambient noise levels inside the building were measured with glass in operation, with the average level (86 dB $L_{Aeq,T}$) used in the model to represent the internal sound level inside the Phase 3 building, with glass operations.

# 8.0 Mitigated Assessment

The noise model has been adjusted to take into account the adopted targeted mitigation measures shown in Table 7-2.

The predicted specific sound levels ($L_{Aeq\text{-}1hour}$), maximum ($L_{Amax,F}$) sound levels and BS4142 assessment with the mitigation in place are summarised below.

## 8.1 Predicted Specific Sound Levels (Mitigated)

Predicted specific sound levels are shown in Table 8-1 for daytime average (07:00-19:00), and daytime peak (14:00-15:00) periods. The reduction in specific sound levels resulting from the mitigation is also shown.

**Table 8-1:** Sounds Levels at Noise-Sensitive Receptors, dB - Mitigated

| Receptor | Predicted Specific Sound Level $L_{Aeq,1hr}$ (Mitigated), dB | | Reduction in Specific Sound Level $L_{Aeq,1hr\ Resulting}$ from Mitigation, dB | |
|---|---|---|---|---|
| | Daytime (0700 – 1900) 'Average' | Daytime (1400 – 1500) 'Peak' | Daytime (0700 – 1900) 'Average' | Daytime (1400 – 1500) 'Peak' |
| NSR01 | 34 | 35 | -2 | -1 |
| NSR02 | 28 | 28 | -3 | -3 |
| NSR03 | 20 | 20 | -3 | -3 |
| NSR04 | 19 | 19 | -2 | -2 |
| NSR05 | 36 | 36 | -3 | -3 |

## 8.2 Partial Sound Levels at NSR01 and NSR05 with and without Mitigation

In order to provide further analysis of the reduction of the total specific sound level, the partial sound levels have again been extracted from the model, in the average day scenario. They have then been ranked depending on their contribution to the specific sound level at NSR01 and NSR05.

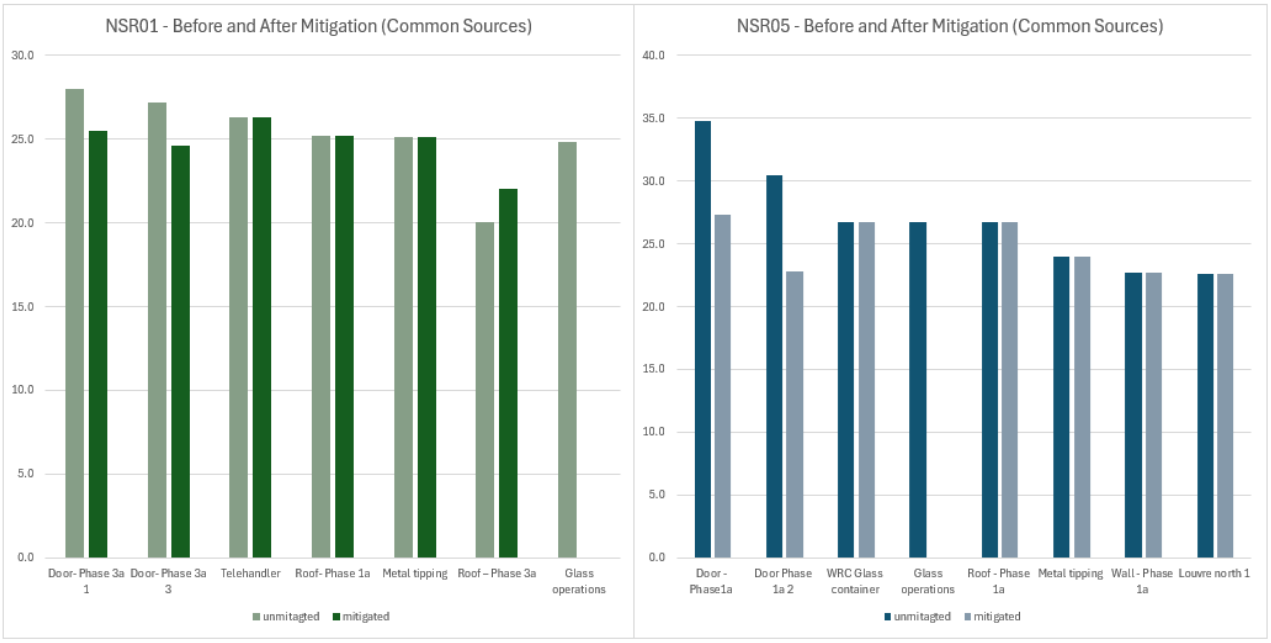
The partial levels from Table 7-1 in the unmitigated and mitigated scenarios have been included in Table 8-2 overleaf. The noise sources have been ranked for average scenario only.

**Table 8-2:** Individual Sources at NSR01 and NSR05, unmitigated and mitigated

| Receptor | Average day - Unmitigated<br>Noise Sources – with the highest contributions to Specific Sound Level $L_{Aeq,1hr}$ | Average day - Mitigated<br>Noise Sources – with the highest contributions to Specific Sound Level $L_{Aeq,1hr}$ |
|---|---|---|
| NSR01 | Door- Phase 3a 1 (28.0dB)<br>Door- Phase 3a 2 (27.9 dB)<br>Door- Phase 3a 3 (27.2 dB)<br>Telehandler (26.3 dB)<br>Roof- Phase 1a (25.2 dB)<br>Metal tipping (25.1 dB)<br>Glass bulking (24.8 dB)<br>Roof – Phase 3a (20 dB) | Telehandler (26.3 dB)<br>Door- Phase 3a 1 (25.5 dB)<br>Roof - Phase 1a (25.2 dB)<br>Metal Tipping (25.1 dB)<br>Door- Phase 3a 3 (24.6 dB)<br>Roof- Phase 3a (22.0 dB)<br>Wall- Phase 3a (19.1 dB) |
| NSR05 | Door - Phase1a (34.8 dB)<br>Door Phase 1a 2 (30.4 dB)<br>WRC Glass container (26.7 dB)<br>Glass bulking (26.7 dB)<br>Roof - Phase 1a (26.7 dB)<br>Metal tipping (24.0 dB)<br>Wall - Phase 1a (22.7 dB)<br>Louvre north 1 (22.6 dB) | Door - Phase 1a (27.3 dB)<br>Roof - Phase 1a (26.7 dB)<br>WRC Glass Container (26.7 dB)<br>Metal Tipping (24.0 dB)<br>Roof- Phase 3a 1 (22.8 dB)<br>Door - Phase 1a 2 (22.8 dB)<br>Wall - Phase 1a (22.7 dB)<br>Louvre North 1 (22.6 dB) |

Where common sources exist in the before and after scenario, further analysis of the noise reduction is shown on Figure 8-1 below, for NSR01 and NSR05. The chart shows the before and after noise level, following the implementation of mitigation measures.

**Figure 8-1:** Chart Showing Sound Levels Before and After Noise Mitigation Measures



Reductions to the partial levels can be seen where mitigation measures, such as closing doors, has been recommended. At NSR05 for example, it can be seen that closing the doors on the Phase 1 building, has resulted in an approximate 8dB reduction.

Glass operations have been removed as an individual source, and are now accounted within the internal noise level modelled for the Phase 3 building.

Only a small sound reduction to the Phase 3 doors is shown Figure 8-1, as the glass operations have been moved inside the building and thus increasing the internal levels as stated above, with the doors being kept shut during glass operations. This is also the reason why a minor increase is noted for the roof level of the Phase 3 building .

# 8.3 Predicted Maximum Sound Levels with Mitigation

To provide information relating to $L_{Amax,F}$ sound levels at NSRs generated by the glass handling within the Phase 3 building, an $L_{Amax,F}$ sound pressure level of 99 dB has been assumed internally, and is based on $L_{Amax,F}$ measurements taken at 10m from an RCV tipping glass inside a similar facility[6].

To calculate the "maximum" level a 100% on-time has been applied to the walls, roof and louvres. Doors have been assumed to be closed during all glass operations (i.e. tipping and bulking).

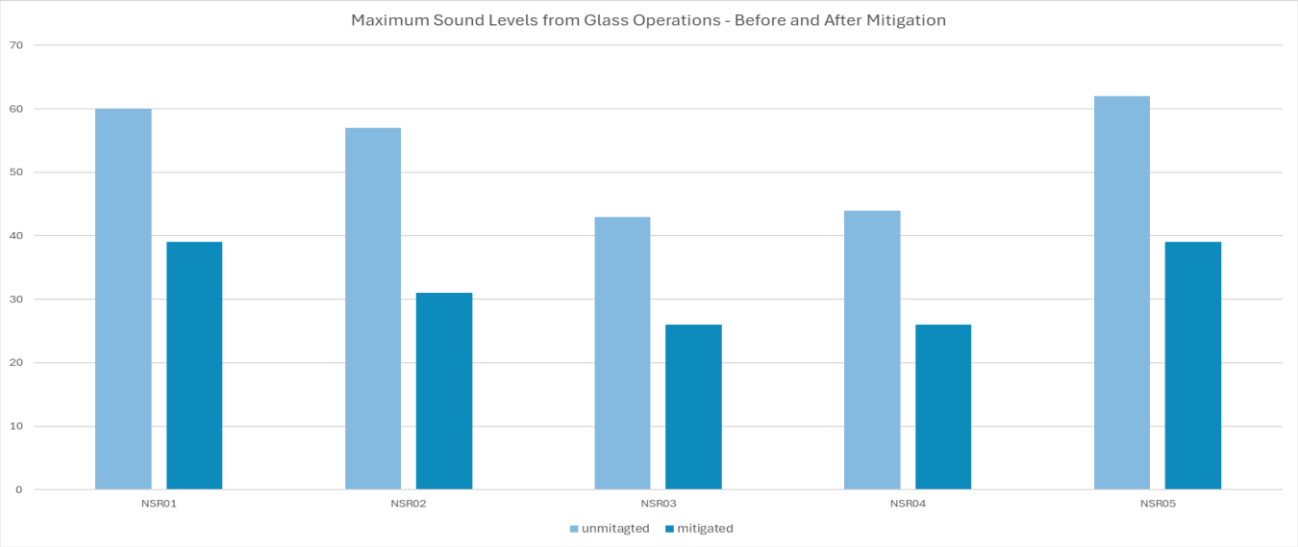
The predicted unmitigated and mitigated $L_{Amax,F}$ levels at each NSR is detailed in Table 8-3, and shown in the chart in Figure 8-2 below.

**Table 8-3:** Predicted $L_{Amax,F}$ Sound Levels- Glass Handling (Mitigated)

| NSR | Unmitigated Level, $L_{Amax,F}$ dB | Mitigated Level, $L_{Amax,F}$ dB | Reduction, $L_{Amax,F}$ dB |
|---|---|---|---|
| NSR01 | 60 | 39 | -21 |
| NSR02 | 57 | 31 | -26 |
| NSR03 | 43 | 26 | -17 |
| NSR04 | 44 | 26 | -18 |
| NSR05 | 62 | 39 | -23 |

[6] Based on measurements undertaken by SLR in 2024 within a recycling reception area at a similar facility (Crymlyn Burrows- SLR report 402.065200.00001)

**Figure 8-2:** Chart Showing Sound Levels Before and After Noise Mitigation Measures, dB $L_{Amax,F}$




The results indicate that $L_{Amax,F}$ sound levels associated with Phase 3 glass handling operations, will be reduced by up to 26 dB, by relocating Phase 3 glass handling to within the Phase 3 building and closing doors when tipping and handling takes place.

# 8.4 BS 4142 Assessment (Mitigated)

The results of the BS 4142 assessment, with mitigation in place, are shown in Table 8-4 below:

**Table 8-4:** BS 4142 Assessment (Mitigated)

| Receptor | Period | Derived Background Level, $L_{A90,T}$ | Predicted Specific Level, $L_{Aeq,1h}$ | Predicted Rating Level, $L_{Ar,T}$ | Difference Between Rating and Background Level |
|---|---|---|---|---|---|
| NSR01 | Daytime Average | 35 | 34 | 40 | +5 |
| | Daytime Peak | 37 | 35 | 41 | +4 |
| NSR02 | Daytime Average | 37 | 28 | 34 | -3 |
| | Daytime Peak | 38 | 28 | 34 | -4 |
| NSR03 | Daytime Average | 32 | 20 | 26 | -6 |
| | Daytime Peak | 34 | 20 | 26 | -8 |
| NSR04 | Daytime Average | 34 | 19 | 25 | -9 |
| | Daytime Peak | 36 | 19 | 25 | -11 |
| NSR05 | Daytime Average | 35 | 36 | 42 | +7 |
| | Daytime Peak | 37 | 36 | 42 | +5 |

The results in Table 8-4 indicate that the rating level does not exceed the background sound level at NSR02, NSR03 and NSR04. BS 4142 states that 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 or significant adverse impact. Where the rating level does not exceed the background sound level, this indicates a low impact, depending on the context.

At NSR01, the mitigated assessment indicate that the rating level exceeds the background sound level by up to 5 dB. BS 4142 states that a difference of around +5 dB is likely to indicate an adverse impact, depending on the context.

The highest exceedance is at NSR05, where the rating level exceeds the background sound level by up to 7 dB. This is likely to indicate an adverse impact, depending on the context.

The results indicate that, with the implementation of mitigation, potential impacts at NSR05 have been reduced from 'significant adverse impact' as indicated within the initial assessment (Section 6.8).

### 8.4.1 NVM Assessment

With reference to the NVM requirements shown in Table 3-1, the NVM result, after consideration of specific noise management controls, at NSR01 and NSR05 is, "*Audible or detectable noise*". NVM advises that, for this result, "*The closest corresponding BS 4142 descriptor is 'adverse impact*'".

Consideration of the context in which the sound will occur, is discussed below.

# 9.0 Context Assessment

## 9.1 Introduction

The context in which sound occurs plays a critical role in assessing the severity of noise pollution. The impact of noise can vary significantly depending on the sensitivity of the receptors and the specific circumstances.

This section summarises the findings of the BS 4142 assessment in both unmitigated and mitigated scenarios for the proposed waste handling facility, particularly focusing on NSR01 and NSR05.

## 9.2 BS 4142 Context Assessment

BS 4142 states: "*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 sources exceeds the background sound level and the context in which the sound occurs.*"

The first requirement of this statement has been addressed within the noise impact assessment. To determine the context in which the industrial sound will reside, especially at NSR01 and NSR05, BS 4142 states three factors must be considered:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor.

### 9.2.1 Absolute Level of Sound

BS 4142 Section 11 states: "*Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.*"

The rating sound level from the Site at the NSR01 and NSR05 is low to moderate (just above 40dB) and exceeds background levels at two receptors. However, it is also relevant to consider absolute levels rather than just the margin between the background and rating levels. A comparison between residual sound levels and total absolute sound levels is shown in Table 9-1.

**Figure 9-1:** Total Absolute Level of Sound at Receptors (Figures in dB $L_{Aeq}$)

| Description | Receptor | |
|---|---|---|
| | NSR01 | NSR05 |
| Typical residual sound level over the full daytime period (i.e. ambient sound at the receptor in the absence of the specific sound). | 42 | 42 |
| Specific Sound Level at the receptor (with mitigation) | 34 | 36 |
| Total absolute level of sound (Residual sound level plus specific sound level) | 43 | 43 |
| Difference between residual sound levels and proposed development sound levels | +1 | +1 |

The results in Table 9-1 show that the noise generated by the proposed development during the full daytime period is below the residual level at NSR01 and NSR05. This indicates no significant increase in absolute noise.

An increase or decrease in noise level of 3dB or less generally indicates no change in loudness, although it could be perceptible. However, there should be no perceived change in the overall sound level at the receptors, nor should it cause a significant impact.

## 9.2.2 Character and Level of the Residual Sound Compared to the Specific Sound

The residual sound environment consists of a mixture of road traffic, agricultural activities, and natural sounds, with some industrial noise contributions from the Puma Energy facility.

The Site, previously developed (brownfield) land, is located immediately north of the 1200-acre Puma Energy site. The site is currently used as a petroleum storage and distribution terminal, with daily freight and HGV movements at the facility. However, the site previously operated as an oil refinery up to 2014, and was known as the Milford Heaven Refinery.

Surrounding land to the north, east, and west is primarily agricultural, with a small number of residential and agricultural buildings.

The closest property, NSR05, is at Robeston Cross and Upper Robeston to the north, and NSR01 is approximately 260 m to the northwest. Both are a similar distance from the Puma Energy facility.

Audible residual sounds at the monitoring position included road traffic, birdsong, and a steady low-level industrial sound from Puma Energy. The industrial sound is audible 24/7, as night-time

data shows only a small reduction in background sound levels, indicating continuous operation of the facility.

However, NRW noted a clear difference in character between the residual industrial sound (steady and continuous), and the specific sound from the Site (intermittent, including impulsive sounds).

However, mitigation measures, such as relocating glass operations inside and closing doors, reduce the impulsive sounds, which have been shown to be reduced by 21 and 23 dB $L_{Amax,F}$ at NSR01 and NSR05 respectively.

### 9.2.3 Sensitivity of Receptor

The existing sensitive receptors are considered to be of moderate sensitivity due to the occupants' need for quiet rest and relaxation. The receptors do not benefit from significant boundary walls (above 1.5m), and garden areas are located close to the existing road network. However, receptors are unlikely to have a direct line of sight into the Site, due to the surrounding vegetation, and the 3m high acoustic barrier. Tree planting on site was specifically undertaken to reduce the line of site from NSR01 and was a requirement of the planning permission.

It is not possible to determine the exact glazing and ventilation specifications installed at the receptors. Therefore, it is assumed that the dwellings are naturally ventilated with no specific mitigation measures, such as façade insulation treatment or ventilation, to control noise ingress from the surrounding area. Despite this, the absolute sound level at the receptors is low, and below the WHO guideline value for outdoor living areas.

The presence of the 3m high barrier provides some degree of acoustic screening, reducing the impact of the specific sound. This indicates that the predicted impacts can be reduced since the absolute sound level is below the guideline value in external areas at the receptors. Internally, sound from the Site will be further reduced and masked by the existing external and internal sound environment.

## 9.3 NRW Context Assessment

In accordance with NRW guidance, a comprehensive assessment of the context considers elements that make the receptors more or less sensitive and how the overall context affects the assessment.

This section builds on the BS 4142 context assessment to determine the overall sensitivity of the receptors and the likely impact of the specific sound from the Site.

### 9.3.1 Elements Likely to Make the Impact More Sensitive:

- Proximity to the Site: Receptors are located close to the road network and industrial activities, increasing noise exposure.
- Lack of Acoustic Insulation: Assumed absence of mitigation measures such as fencing around gardens, façade insulation, or ventilation.

- Garden Areas: Garden areas used for rest and relaxation are sensitive to changes in noise levels.
- Meaningful Sound: The operations associated with the Site may produce sounds perceived as unpleasant or intrusive beyond their acoustic characteristics, potentially causing annoyance or discomfort due to associations with industrial activities.
- Existing and Historical Industrial Operations: Previous and ongoing industrial activities may have already impacted the area, potentially increasing receptor sensitivity to additional noise.

### 9.3.2 Elements Likely to Make the Impact Less Sensitive:

- Acoustic Screening: Presence of a 3m high barrier and surrounding vegetation reduces sound from the Site and reduces the line of sight. Additionally, the relocation of glass operations, and the use of closing of doors, will provide further acoustic screening, and aid in reducing sound levels from the site.
- Low Absolute Sound Levels: The absolute sound level (i.e. existing residual level, plus specific level from the Site) at the receptors is low, and below WHO guideline values for outdoor living areas, indicating a reduced impact.
- Operational Noise Management: Implementation of future targeted mitigation measures and good noise management practices further reduce the potential impact.
- Daytime Hours Only: Permitted site operations only occur during typical daytime hours.

## 9.4 Summary of Context Affecting the Assessment

Considering the overall context, the initial impacts identified in the BS 4142 assessment remain at an adverse level. The proximity of receptors to the road network and industrial activities heightens noise exposure, but the collective noise mitigation measures, which have been designed into the Site and operations, will help mitigate this by providing acoustic screening and reducing the line of sight. The low to moderate overall noise level and mitigation measures prevent significant impacts.

While some sounds from the Site may be perceived as intrusive, especially impulsive sounds, mitigation efforts—such as relocating glass operations indoors—ensure that the rating and specific level, remains low and below WHO guideline values for outdoor living areas.

Although the surrounding area has a history of industrial noise, however as noted NRW consider that the intermittent and impulsive nature of specific sounds from the Site could still be noticeable. However, with the context and mitigation measures in place, the overall impact remains at an adverse impact level, ensuring compliance with BS 4142 and NRW requirements.

## 9.5 Summary

The assessment concludes that the noise impact from the proposed operations at the Site at NSR01 and NSR05, meets the criteria for 'Audible or detectable noise' as defined by NRW. This indicates that noise pollution is being (or is likely to be) caused at a receptor. However, implementing appropriate measures to prevent or minimise noise ensures compliance.

Given the mitigation measures designed in, the contextual issues, and the fact that sound levels remain below WHO guidelines for outdoor areas, the noise impact aligns with the 'adverse impact' descriptor of BS 4142. This ensures that NRWs requirements for 'Audible or detectable noise' are met, provided measures are rigorously demonstrated and implemented.

At all remaining receptor locations the noise impact aligns with the 'low impact' descriptor of BS 4142, it is expected that sound from the Site will not be audible, or will be barely audible/detectable. This indicates that the impact at these locations will either not be perceptible or will be so minimal that it does not impact the overall acoustic environment.

Consideration of elements of uncertainty associated with noise survey and assessment, are set out within Section 10.0 of this report.

Appropriate measures to prevent or minimise noise pollution and ensure compliance, are set out within Section 11.0 of this report.

# 10.0 Uncertainty

## 10.1 Baseline Sound Survey

BS 4142 requires consideration of uncertainty associated with measured baseline levels. Measurement uncertainty was minimised for the background sound measurement using the following steps:

- Measurement locations were representative of the nearest noise-sensitive receptors to the site;
- Measurement positions were located away from reflecting surfaces and leaf vegetation;
- Measurements were undertaken using a logging period of 15-minutes considered to provide representative background sound levels;
- The sound measurements included weekday and weekend periods;
- Measurements were rounded to the nearest one decimal place before the final calculations;
- Instrumentation was appropriate and in accordance with Section 5 of BS 4142; and
- The survey was undertaken by a competent acoustician.

## 10.2 Operational Noise Levels

BS 4142 requires consideration of uncertainty associated with the operational levels of the various noise sources utilised in the assessment.

Source data has been assumed to be worst-case, and based on the initial detailed design information.

## 10.3 Predicted Noise Levels

Based on the accuracy of the prediction methodology, i.e. ISO9613-2, the uncertainty of the CadnaA model accuracy, i.e. contour data, barrier corrections for buildings, etc., it is considered that the results of the assessment are as accurate as reasonably practicable and considered to be within +/-3dB.

## 10.4 Impact of Uncertainties

The above uncertainties could result in rating levels being marginally higher, potentially exceeding the background level further. However, the assessment is based on a worst-case scenario for specific sound levels and operations, and the absolute levels would likely remain moderate, and the impact is unlikely to be significant.

# 11.0 Appropriate Measures Justification

## 11.1 Introduction

In accordance with the NRW guidelines, this section provides a justification of the appropriate measures that will be employed at the Site to prevent or minimise noise pollution. The Site operators must prevent significant pollution and comply with the requirements to use 'appropriate measures' (Waste Framework Directive 2018/851) to prevent or minimise noise pollution.

The justification of appropriate measures follows the findings of this assessment, including the initial BS 4142 results and the context evaluation, to ensure that the facility operates within acceptable noise levels and minimises pollution as far as reasonably practicable.

## 11.2 Dominant Sources

The noise model has indicated that the dominant noise sources expected at the Site include:

- Phase 1 Main Building (Internal operations) : Noise generated by internal operations related tipping, and the sorting and baling of waste. At the time of writing, the Site is not fully operational, however, the assessment is based on an internal level of 84 dB $L_{Aeq}$ (when in full operation, not accounting for intermittency), which is considered to be a worst-case level.
- Main Building (Doors) : Open doors on the main building were identified as a key contributor to the noise impact, especially at NSR05, where they were up to 8 dB louder than other sources, which indicates its likely dominance.
- Glass Operations: The external glass bay was previously identified as a potentially significant source, primarily due to the handling and movement of glass. External glass operations will now be moved inside the Phase 3 building.
- WRC Glass: Regarding WRC Glass, it is anticipated that this glass bin will be used rarely by householders as they receive kerbside glass recycling collections. However, it is expected that this facility will be used infrequently by some smaller businesses (as the majority of businesses receive trade waste collections). Mixed Glass is stored in a 20 cu/yd skip and is expected to be replaced and taken off-site once every 2 weeks.
- Covered Bays: At NSR01, the model indicates that sound from mobile plant operating near the covered bays could be dominant. This includes sources such as a cordless blower, telehandler, and pressure washer, which has been modelled as point sources in the model, but are very likely to move around the area during the working day, including areas where they are screened, and therefore will be less dominant.
- Vehicle Movements: Noise from HGVs and other vehicles entering, operating within, and leaving the site.
- Loading and Unloading Activities: Impulsive sounds from the handling of waste materials during loading and unloading processes.

# 11.3 Existing Noise Attenuation Measures

Although the site is not yet operational, extensive design work has been undertaken to ensure effective noise attenuation. This includes the following measures which have been considered in the design to minimise noise pollution:

- Closing Doors: As part of this updated assessment, new mitigation measures have been proposed which includes restrictions to the doors on the Phase 1 and Phase 3 buildings, as follows:
    - Phase 1 Main building – Two doors on the northern facade, which can be open for no more than 15 minutes (25%) within an hour.
    - Phase 3 Residual waste building – All doors to be closed during glass handling operations (to control LAmax,F levels), and must be open for no more than 30 minutes (50%) within an hour (to control specific levels).
- Noise Barriers: Noise barriers have been strategically located around the site to provide additional attenuation for noise sources that cannot be enclosed or silenced. These barriers are constructed from materials with high acoustic attenuation properties and are of sufficient height and length to effectively shield sensitive receptors from site noise and maximise their potential effectiveness.
- Placement Consideration: The location of key noise-generating equipment has been carefully considered to maximise distance and screening to the sensitive receptors. This has included moving glass operation inside the Phase 3 building.
- Operating Hours: The site will be highly regulated, which includes strict operating times which will minimise noise impact during sensitive periods. Operational hours will be limited, with no permitted activities conducted during night-time hours.
- Local Authority Management: The site will be run by the local authority, ensuring adherence to stringent regulations and operating times. This management provides an additional layer of oversight and commitment to maintaining compliance with noise regulations.
- Best Working Practices: In addition to physical measures, implementing good working practices will be critical in minimising noise pollution. These practices will include:
    - Regular Equipment Maintenance: Ensuring all machinery and equipment are well-maintained to prevent excessive noise due to mechanical issues or wear and tear.
    - Operator Training: Training staff on noise minimisation techniques, such as operating machinery at lower speeds when possible and avoiding unnecessary idling of equipment.
    - Minimising Impact Noise: Using soft-handling techniques when loading and unloading materials to reduce impulsive noises. This includes dropping materials from lower heights and using dampened surfaces where possible. Use sympathetic timing to control unavoidably noisy operations.
    - Communication Protocols: Establishing clear communication protocols to ensure that noisy operations are coordinated and managed to avoid overlap with other high-noise activities, particularly during more sensitive times of the day.
    - Monitoring and Review: Implementing regular noise monitoring, and site walk-overs to assess the effectiveness of noise attenuation measures and working practices. This will allow for continuous improvement and timely adjustments to practices as needed.

# 11.4 Future Noise Reduction Techniques

Given the predicted sound levels, implementing effective noise reduction techniques is essential for minimising environmental impact. The following techniques could be considered in the future to address the dominant noise sources, but they will only be required if identified by the proposed post-permitting monitoring exercise once the site becomes operational.

It is important to note that only two receptors are affected, so the focus should be on minimising impacts specifically to these locations. These strategies align with NRWs guidance on appropriate noise control measures and will be further evaluated once the Site becomes operational.

- Main Building (Internal Operations): Use of sound barriers internally, enclosures around sorting and baling plant, and use of low-noise machinery would minimise noise at source. Scheduling high-noise activities during less sensitive times.
- Covered Bays: Given the nature of the materials handled in the covered bays, mitigation options are limited. However, the use of acoustic absorption panels or baffles could target specific noise issues.
- Glass Operations (now indoors): Since glass operations have been move indoors, a significant noise reduction has already been shown. Monitoring the effectiveness of this move will determine if further measures are necessary. This addresses the previous need for external enclosure, reducing the need for additional intervention.
- WRC Glass: The initial indications are that this glass bin will be used infrequently, and only taken off site every 2 weeks. However, if this source is identified, then consideration for an alternative placement and/or bin type, would be considered.
- Vehicle Movements and Loading Activities: Scheduling unloading and loading activities can be very difficult due to the nature of the Site and its operations. However, where feasible, additional soft-handling techniques and effective management practices could be implemented to reduce noise impacts from this activity.

By following this approach, the current focus is on implementing practical and achievable noise control measures, with the understanding that further evaluation and adjustments may be required based on real-world data. This approach is intended to ensure that the noise control strategy will be both effective and proportionate to the actual impact, ultimately supporting compliance with noise regulations.

# 11.5 Upgrades and Commitments

Given that the site is not yet operational, committing to specific upgrades is not possible at this stage. However, it is proposed that a full noise assessment will be undertaken within 3 to 6 months of the site becoming operational.

This assessment can then provide a detailed evaluation of the actual noise levels on site and at the receptors, and the effectiveness of the implemented noise control measures. Based on the findings, any necessary upgrades or additional mitigation measures will be identified and implemented.

Additionally, any noise issues that arise in the intervening period will also be thoroughly investigated. Should these investigations reveal a need for immediate action, appropriate measures will be taken to address the noise concerns promptly.

Where upgrades are identified, the following actions will be taken:

- The predicted impact of the works will be clearly stated, providing an understanding of how these upgrades will contribute to reducing noise levels and improving compliance with regulations.
- Firm completion timescales will be established and committed to, ensuring that any necessary upgrades are carried out promptly and effectively.

This will ensure that noise management at the site remains flexible, and responsive to the actual conditions encountered during operations. By regularly assessing and adjusting noise control measures, the site will continue to meet regulatory requirements and minimise potential noise impacts.

## 11.6 Noise management Plan

As part of this assessment, a noise management plan has been developed and is set within Section 12.0 of this report.

## 11.7 Summary of Appropriate Measures

The Site will implement and continue to implement appropriate measures and BAT to prevent or minimise noise pollution. By addressing dominant noise sources, employing effective noise attenuation measures (such as the use of noise barriers, closing doors, and moving glass operations inside to enclose the noise), considering additional noise reduction techniques, and potential future upgrades, the Site demonstrates its commitment to operating within acceptable noise levels and minimising environmental impact.

This justification of the appropriate measures ensures that the facility's operations are in line with NRW guidelines.

## 11.8 Assessment Conclusion

SLR has been appointed by WRAP on behalf of PCC to produce a Noise Impact Assessment (NIA) and a Noise Management Plan (NMP) for the Eco-Park in Milford Haven, Pembrokeshire. The NMP is required to support the site's permit application and is based on the requirements presented in the NRW noise guidance.

It is supported by an NIA conducted in accordance with BS 4142, which assesses the potential impact of industrial or commercial sound at noise-sensitive receptors within the existing noise environment.

At the time of writing, noise data for the sources of sound at the Site is not available. SLR has conducted operational noise surveys at similar facilities, including internal measurements. The report presents the unmitigated scenario which shows a significant impact.

A review of noise control measures has therefore been undertaken, and further mitigation measures have been included in order to reduce sound from the Site. This includes various restrictions to the opening of doors on the Phase 1 and Phase 3 buildings, and the relocation of glass operations indoors with doors kept closed during all glass handling operations.

The mitigated assessment concludes that the noise impact from the proposed operations at the Site at NSR01 and NSR05, meets the criteria for 'Audible or detectable noise' as defined by NRW. This indicates that noise pollution is being (or is likely to be) caused at a receptor. However, implementing appropriate measures to prevent or minimise noise ensures compliance.

Noise mitigation measures such as barriers, closing of building doors, and moving glass operations inside to enclose the noise have been recommended as part of this updated assessment in order to the overall impact at the receptors.

Given these mitigation measures designed in, the contextual issues, and the fact that sound levels remain below WHO guidelines for outdoor areas, the noise impact aligns with the 'adverse impact' descriptor of BS 4142. This ensures that NRWs requirements for 'Audible or detectable noise' are met, provided measures are rigorously demonstrated and implemented.

At all remaining receptor locations the noise impact aligns with the 'low impact' descriptor of BS 4142, it is expected that sound from the Site will not be audible, or will be barely audible/detectable. This indicates that the impact at these locations will either not be perceptible or will be so minimal that it does not impact the overall acoustic environment.

Given that the site is not yet operational, committing to future upgrades is not possible at this stage. However, it is proposed that a full noise assessment will be undertaken within 3 to 6 months of the site becoming operational.

This assessment can then provide a detailed evaluation of the actual noise levels on site and at the receptors, and the effectiveness of the implemented noise control measures. Based on the findings, any necessary upgrades or additional mitigation measures will be identified and implemented.

The Site will implement appropriate measures to prevent or minimise noise pollution. By addressing dominant noise sources, employing effective noise mitigation measures, and considering additional noise reduction techniques, the Site demonstrates its commitment to operating within acceptable levels while minimising the impact. The NMP in Section 12.0 includes guidance on general noise management of plant operations and outlines the steps to be taken if a noise complaint is received from a local resident.

In summary, the analysis of the appropriate measures ensures that the facility's operations are in line with NRW guidelines and provides a clear framework for ongoing noise management and mitigation efforts.

# 12.0 Noise Management Plan

The noise assessment has indicated that, in accordance with the guidance in BS 4142, the predicted rating levels would be below the likely onset of adverse impact at all locations during the operation of the facility.

Notwithstanding this, best practice measures for the control of noise levels within the site would be implemented. These measures are detailed in the following sub-sections, along with other site management procedures.

## 12.1 Objectives

NMPs are developed and employed to the following principals:

- Identify and employ all appropriate measures to minimise the generation of noise and subsequent exposure/impact;
- Prevent exposure of people outside the site to levels of noise which would result in complaints; and
- Minimise the risk of unplanned 'noisy' events which have the potential to result in off-site noise complaints.

It is a working document with the specific aims of ensuring that:

- Noise impact is considered as part of all operations;
- Noise is primarily controlled at source by good operational practices, the correct use and maintenance of plant, and by operator training; and
- All appropriate measures are taken to prevent or, where that is not reasonably practicable, to minimise noise emanating from the site.

### 12.1.1 Status

The specification for the periodic review and update of this NMP is on an annual basis as a minimum. The site's management team have overall responsibility for the implementation and administration of this NMP. The NMP is issued to all contractors on the site, and they are required to read and adhere to the NMP for the duration of their contract. This NMP is intended to be a live document which serves as a reference during daily operations on the site and as such, will be updated on a more frequent basis if:

- Significant changes are made to the plant and/or operations within the site;
- NRW requests that the NMP is updated, in their role as regulator; or
- Complaints are received, which on subsequent investigation result in the identification of further control measures or remedial action, in addition to those set out within this NMP.

# 12.2 Receptors

For reference, and in accordance with Appendix 4 of the NRW guidance, the closest receptors have been identified and are presented in Table 12-1 below. This also includes the representative background sound levels and predicted specific sound level at each receptor location, which are all identified as residential properties. The information in Table 12-1 is referenced to the NIA presented in Sections 5 (noise survey) and 8 (mitigated assessment) of this document.

**Table 12-1: Receptors**

| Receptor | Location | Approximate Distance to Site, m (Direction) | Representative Background Sound Level, $L_{A90}$ | Mitigated Specific Sound Level, $L_{Aeq,T}$ |
|---|---|---|---|---|
| NSR01 | Upper Robeston Farm, residential property to the north of the Site, located between Robeston Cross and Robeston West (SA73 3TL). Representative of the of properties in Robeston West including Lawn View and Little Welsh Wood. | 200 (west) | 35 | 36 |
| NSR02 | Thornhill, residential property located to the north-east of the Site (SA73 3TN) | 600 (north-east) | 37 | 36 |
| NSR03 | Woodson, residential property located in Lower Thornton (SA73 3UQ), to the east of the Site | 1100 (east) | 32 | 34 |
| NSR04 | Rickeston Water, residential property located in Rickeston (SA73 3TJ), to the west of the Site. | 1000 (west) | 34 | 34 |
| NSR05 | Residential property (used as holiday let) at Robeston Cross, to the north of the Site. | 80 (north) | 35 | 23 |

Section 6.3 of the NIA identifies the noise sources on site for each phase of the proposed development. As each receptor is located at a different distance and direction from the site (as per Section 6.4), the contributing noise sources will be different depending on their relative position within the site.

Following the receipt of a complaint, the noise sources should be revised based on the perception of operations at the noise-sensitive receptors.

# 12.3 General Noise Management

## 12.3.1 Sources of Noise

The sources of noise to which this Noise Management Plan relates to are included in the Noise Impact Assessment. Plant included is all plant that operates under normal conditions. The plant is identified in Section 6.3.

## 12.3.2 Site Infrastructure Design

The design of the site's infrastructure affords a level of noise mitigation and management including:

- A 3m high acoustic barrier (a Gramm METASoundBlok (Rated A5 and B3) is installed at the site's northern boundary and the western side of the Phase 3 covered spare bay;
- With the exception of the WRC, in which all activities are outdoors, waste sorting and baling operations are only carried out within the main recycling building. At the WRC all waste operation activities occur within the appropriate designated containers/areas; and
- On the Phase 1 recycling building, a maximum of 2 doors will be operational, for up to 25% of the time.
- On the Phase 3 building, a maximum of 2 doors will be operational, for up to 50% of the time.
    - Additionally, glass operations will be moved to inside the Phase 3 building. Vehicles will tip within the building, and doors will be closed whilst tipping and bulking takes place (additionally, as above- it is also assumed that doors will be closed 50% of the time).

## 12.3.3 Plant Operations

Within the constraints of efficient site operations and the requirements of the relevant British Standards, the following mitigation measures are observed:

- The use of particularly noisy plant is limited, i.e. wherever possible, particularly noise plant is not used early in the morning;
- The number of plant items in use at any one time is minimised;
- Plant maintenance operations are undertaken within the Phase 2 area (outside of the EP boundary) as far away from noise sensitive receptors as possible;
- All vehicles are washed and re-fuelled at the end of the day in the Phase 2 area (outside of the EP boundary) when vehicles return as opposed to early in the morning;
- Collection vehicles are reversed into parking spaces at the end of the day to reduce the noise from reversing beacons early in the morning. Parking is provided within the Phase 2 area (outside of the EP boundary);

- Vehicle idling time on site is minimised;
- The speed of vehicle movements is kept to a minimum, and speed limits are implemented on site to reduce noise levels associated with high engine speeds;
- Operations are designed to be undertaken with any directional noise emissions pointing away from noise sensitive receptors where practicable; and
- When replacing older plant, the quietest plant available is considered wherever possible.

### 12.3.4 Training

The site induction programme and site rules include good working practice instructions for site staff, supervisors and contractors to help minimise noise whilst working on the site.

The working practice instructions include, but are not limited to, the following points:

- Avoid unnecessary revving of engines;
- Minimise drop heights where practicable;
- Plant used intermittently should be shut down between operational periods;
- Avoid reversing wherever possible;
- Drive carefully and within the site speed limit at all times;
- Report any defective equipment/plant as soon as possible so that corrective maintenance can be taken; and
- Site personnel are trained in the need to minimise noise and are responsible for monitoring and reporting excessive noise when carrying out their everyday roles.

### 12.3.5 Maintenance

A high level of equipment servicing and maintenance is adhered to on site, including:

- Visual and aural inspections and checks of all plant and equipment, to ensure that any interim maintenance is identified and repairs are undertaken by a qualified engineer as soon as possible, i.e. a 'stop and fix' policy, utilising spare parts held on site in the event of required maintenance;
- All servicing and maintenance of plant is conducted in line with manufacturers recommendations, and subject to the planned preventative maintenance schedule;
- Where maintenance is required, this is undertaken as far away from receptors as possible;
- All equipment maintenance is recorded in the maintenance record and checklists contained within the EMS; and
- Site access and operational areas are maintained and repaired to minimise noise resulting from uneven and poor surfacing.

### 12.3.6 Public Relations

It is essential to maintain good public relations with local residents; therefore, the following procedures are implemented on site:

- Maintaining a tidy and efficient site;
- Advance notice and an explanation of activities is given for anything that might cause complaint;
- All staff are environmentally aware and are trained to deal with complaints and issues;
- Good lines of communication are ensured by:
    - Nominating a point of contact for issues relating to the site;
    - Keeping a systematic record of complaints and the remedial actions taken (see Section 12.4);
    - Following up complaints with correspondence and action;
    - Being prepared to be flexible; and
    - Trying to co-operate and avoid being adversarial.

### 12.3.7 Incidents that may Influence Noise Risk

In line with Public Relations the following may be considered important when considering noise impact upon nearby NSRs:

- Abnormal operations such as the rerouting of HGVs due to road repairs.
- Emergency works such as the testing of alarms. Tests should be completed on a weekday at a less intrusive time, for example 10 am.
- Emergency operations such as a power or outage requiring the use of the sites backup generator.
- Machinery breakdown resulting in less processing equipment being used and waste likely needing to be redirected elsewhere. Waste present onsite may need to be removed- thus increased use of HGVs and small mobile plant.
- A fire incident. Sorting kit and machinery shut down, but increased use of cleaning equipment; may also be associated with increased use of small mobile plant to move waste around, and increased use of cleansing equipment for clean-up.
- Spillage: possibly pausing certain operations or traffic if spillage is on access road; while increased use of cleansing equipment.
- Odour or dust incident. Waste may need to be rapidly removed from site, thus increased use if HGVs; and cleansing equipment.

Should any of the above occur consideration must be given to informing NSRs and updating the residents as appropriate.

# 12.4 Complaints Procedure

A complaints system is maintained by PCC for the site, ensuring that any complaints relating to noise are recorded and investigated as appropriate.

The site's management team are the point of contact in the event of a complaint regarding noise from within the site. Each noise complaint will be logged upon receipt and a record of all complaints will be kept including the remedial actions taken. This will be via the use of a record sheet contained within the EMS which follows the format in Table 12-2.

**Table 12-2:** Noise Complaint Form

| Noise Complaint Form | |
|---|---|
| Name and address of complainant | |
| Contact number for complainant | |
| Date and time of complaint | |
| Date, time and duration of offending noise | |
| Weather conditions e.g. dry, rain, fog, snow | |
| Wind strength and direction, e.g. light, steady, strong, gusting | |
| Complainant's description of noise e.g. hiss, hum, rumble, continuous, intermittent | |
| Does complainant have other comments about the offending noise? | |
| Any other previous known complaints relating to the site? (All aspects, not just noise) | |
| Potential noise sources that could give rise to the complaint | |

| | |
|---|---|
| Operating conditions at the time the offending noise occurred | |
| Any other relevant information | |
| Action taken | |
| Final outcome | |
| Date: | Form completed by: |
| Reference No.: | Signed: |

### 12.4.1 Receipt of a Complaint or Request from NRW

If a complaint is received by a local resident, an investigation shall be instigated within one working day to identify the cause of the complaint.

Such an investigation will involve the identification and possible cessation of the activity or activities considered to be the cause of the complaint and/or the investigation of mitigation measures to reduce the noise emission levels from the activity or activities.

Any deviation from agreed working practices shall be identified immediately and conformance to the working practice reinstated.

A complaints response system is maintained by PCC, enabling any complaints regarding noise to be reported and appropriate action taken.

## 12.5 Noise Monitoring

If continuous offsite noise emissions are detected, alongside complaints being received by members of the public, correspondence with NRW would be undertaken to discuss the potential requirement for quantitative noise monitoring at the areas / receptors of concern.

# Appendix 1: Monitoring Equipment in Situ

**Figure 12-1 Monitoring Position MP1**

**Figure 12-2 Monitoring Position MP2**

**Figure 12-3 Monitoring Position MP3**

**Figure 12-4 Monitoring Position MP4**

# Appendix 2: Monitoring Results

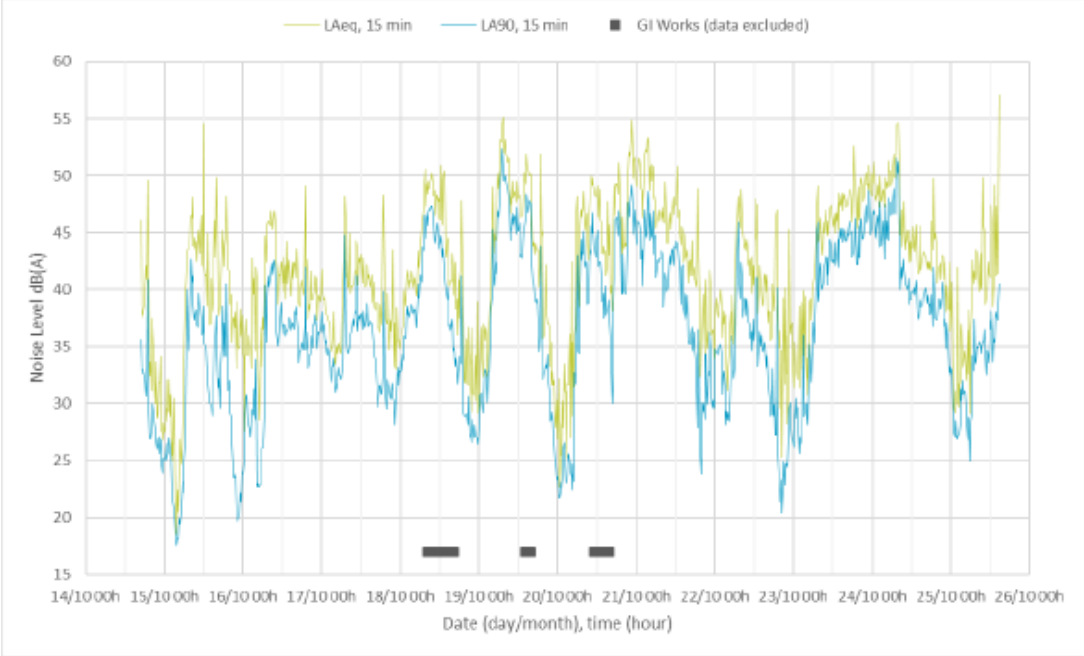



**Figure 12-5** Time-history Sound Levels at MP1, dB (A)

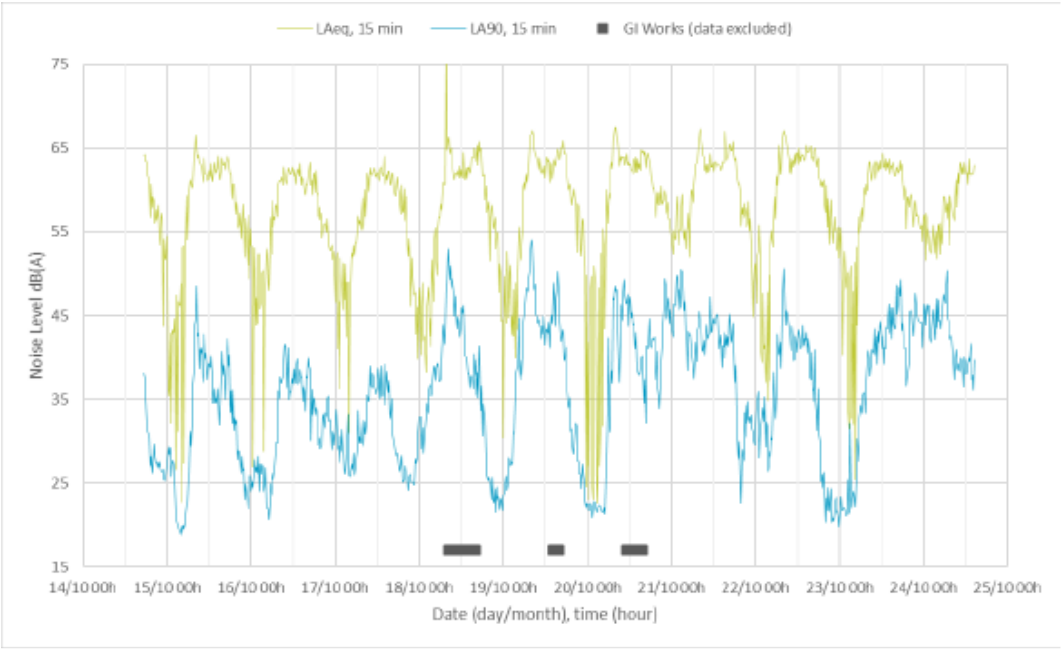



**Figure 12-6** Time-history Sound Levels at MP2, dB(A)

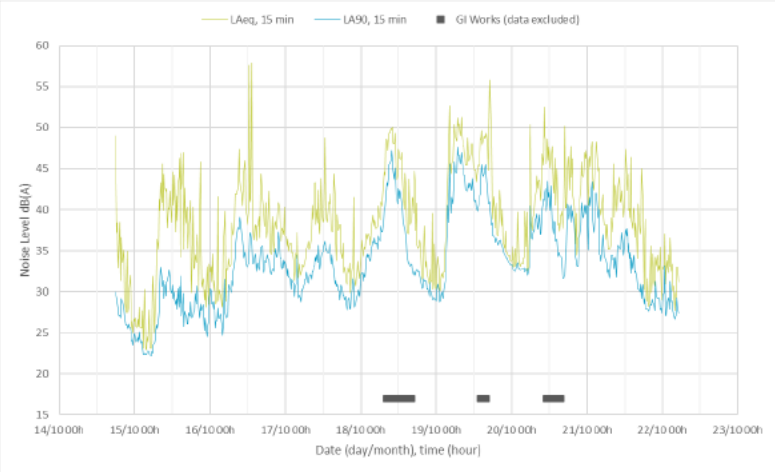



**Figure 12-7** Time-history Sound Levels at MP3, dB(A)

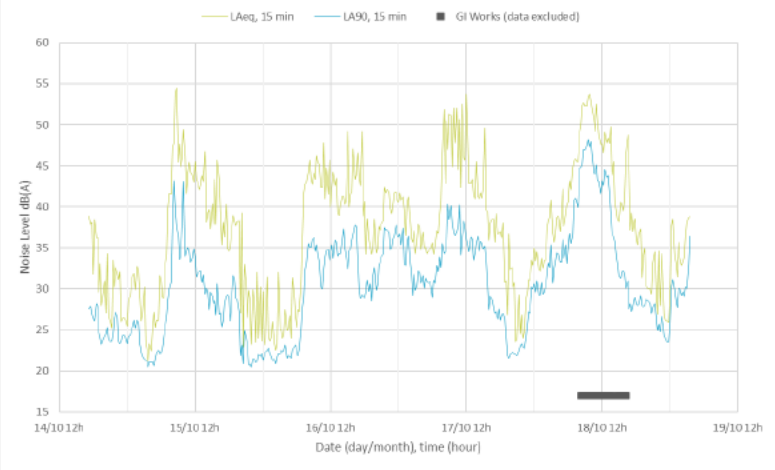



**Figure 12-8** Time-history Sound Levels at MP4, dB(A)

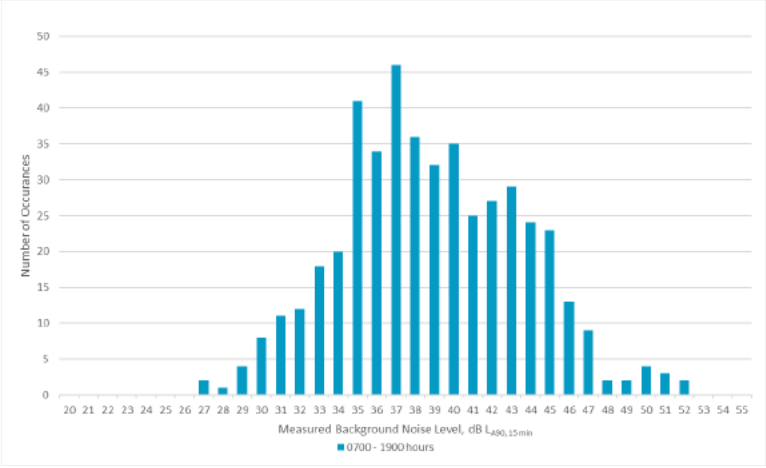



**Figure 12-9** Occurrence of Background Sound Levels at MP1, , dB $L_{A90,T}$

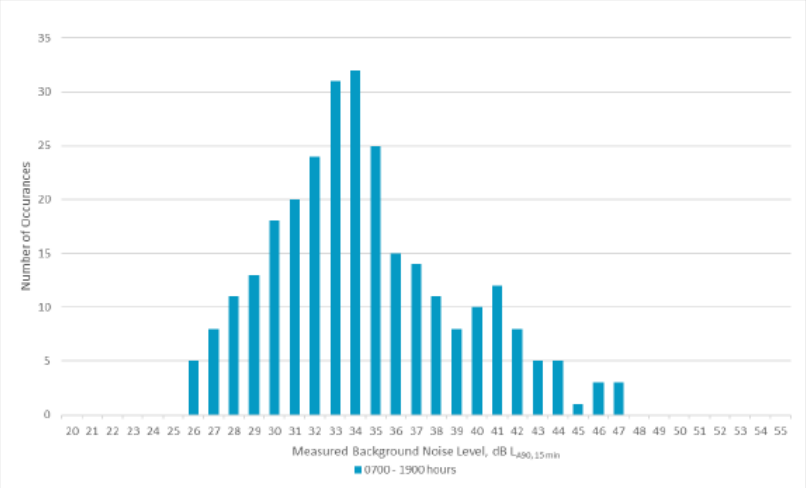



**Figure 12-12** Occurrence of Background Sound Levels at MP2, , dB $L_{A90,T}$

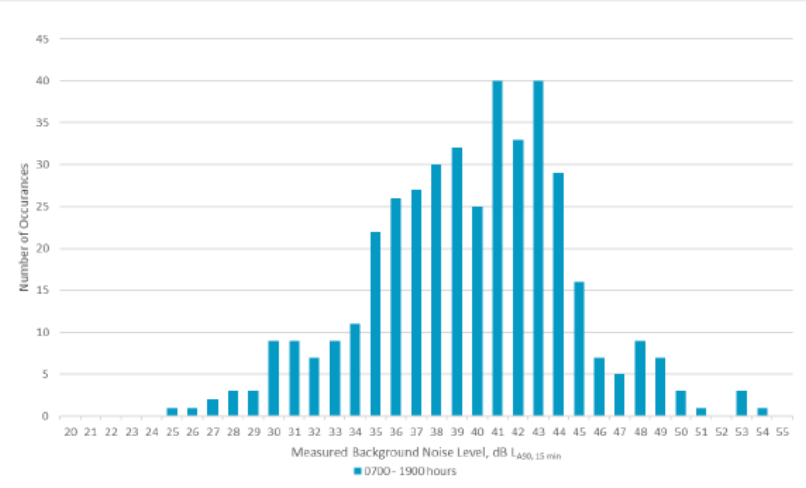



**Figure 12-11** Occurrence of Background Sound Levels at MP3, , dB $L_{A90,T}$

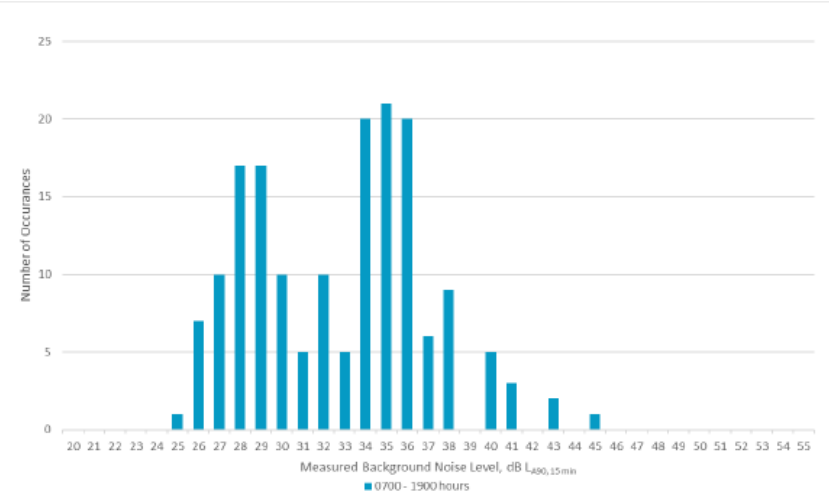



**Figure 12-10** Occurrence of Background Sound Levels at MP4, , dB $L_{A90,T}$

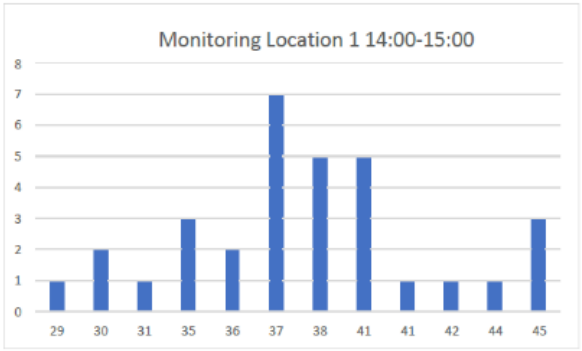



**Figure 12-14** Occurrence of Background Sound Levels at MP1, 1400 – 1500, dB $L_{A90,T}$

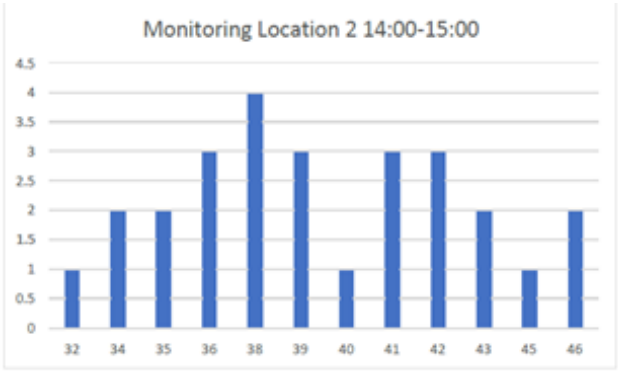



**Figure 12-13** Occurrence of Background Sound Levels at MP2, 1400 – 1500, dB $L_{A90,T}$

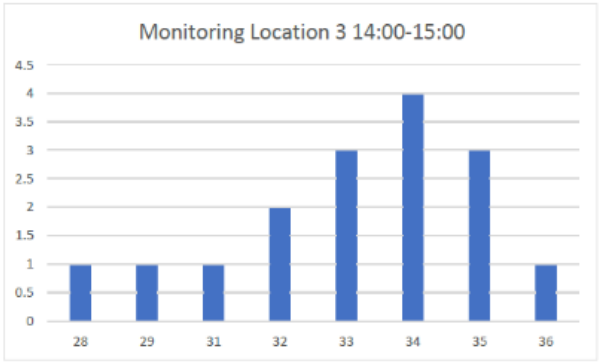



**Figure 12-15** Occurrence of Background Sound Levels at MP3, 1400 – 1500, dB $L_{A90,T}$

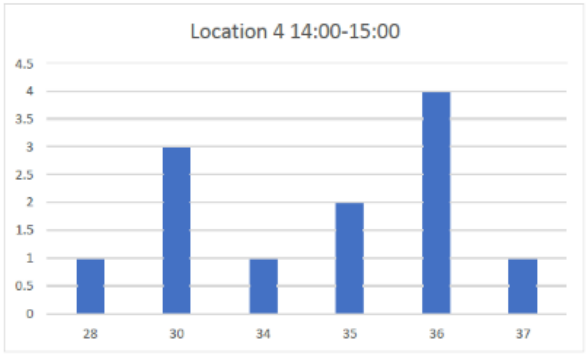



**Figure 12-16** Occurrence of Background Sound Levels at MP4, 1400 – 1500, dB $L_{A90,T}$

# Appendix 3: Operational Sound Levels

Operational sound levels used within the model of the Phase 1 and Phase 3 buildings, are based on measurements undertaken by SLR in 2024, within a recycling reception area at a similar waste facility in Wales (Crymlyn Burrows- SLR report 402.065200.00001).

That facility comprises a single building with two areas; the waste reception area residual waste, green waste, bulky and AHP are deposited into designated bays, and the recycling reception area, for separately collected food waste, paper, glass, cardboard, and co-collected plastic and cans are deposited into their designated bays.

Plastic and cans are then sorted further on the Materials Recovery Facility process line to recover metals and plastics.

Other plant sources included loading shovel and balers.

The measurements were all undertaken inside the building, and located approximately 10m from the activity described. Each measurement was undertaken over a 1-minute period, and included noise from various specific activities close by, and noise from other sources within the building, as detailed in TABLE 12-3 below.

**Table 12-3:** SLR Measured Sound Levels

| Model Input | Area of Site | Noise Climate/Description | Measured $L_{Aeq,1min}$ | Average LAeq,t |
|---|---|---|---|---|
| Phase 1 and Phase 3 Building (**without** glass) | Recycling Reception | General ambient noise including RCVs at various stages of unloading and a loading shovel operating. | 85.6 | 84 |
| | | | 82.7 | |
| | | | 83.4 | |
| | | | 85.5 | |
| | | | 85.3 | |
| | | | 84.3 | |
| | | | 87.5 | |
| | | | 80.0 | |
| | | | 82.1 | |
| | | | 82.3 | |
| | | | 82.5 | |
| | | | 83.2 | |
| | | | 83.7 | |
| | | | 81.0 | |

| | | | | |
|---|---|---|---|---|
| | | | 83.0 | |
| Phase 3 Building (**with** glass) | Recycling Reception | General ambient noise including RCVs at various stages of unloading, a loading shovel operating. and RCV glass tipping and bulking. | 88.5 | 86 |
| | | | 91.1 | |
| | | | 90.2 | |
| | | | 88.1 | |
| | | | 89.7 | |
| | | | 85.6 | |
| | | | 82.7 | |
| | | | 83.4 | |
| | | | 85.5 | |
| | | | 85.3 | |
| | | | 84.3 | |
| | | | 87.5 | |
| | | | 80 | |
| | | | 82.1 | |
| | | | 82.3 | |
| | | | 82.5 | |
| | | | 83.2 | |
| | | | 83.7 | |
| | | | 81 | |
| | | | 83 | |

General ambient noise levels inside the building were measured **without** glass in operation, and the log average level of 84 dB $L_{Aeq,T}$, has been used in the model, to represent the internal sound level inside the Phase 1 building, and the Phase 3 building in the unmitigated scenario without glass operations inside.

General ambient noise levels inside the building were also measured **with** glass in operation, and the log average level (86 dB $L_{Aeq,T}$), has been used in the model to represent the internal sound level inside the Phase 3 building, in the mitigated scenario with glass operations inside.

**WRAP's vision is a thriving world in which climate change is no longer a problem.**

Our mission is to make the world a more sustainable place. We bring people together, we act on the facts, and we drive change.

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