RSK Acoustics

Shelton Road, Corby - Energy from Waste Facility

# Noise Impact Assessment

Report 2061667-RSKA-RP-001(06)

Shelton Road, Corby - Energy from Waste Facility

# Noise Impact Assessment

2061667-RSKA-RP-001(06)

Encyclis Limited

Lynton House
7 – 12 Tavistock Square
London
WC1H 9LT

| Revision | Description | Date | Prepared | Approved |
|---|---|---|---|---|
| 0 | Internal review | 24 Feb 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |
| 1 | Issued version | 28 Feb 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |
| 2 | Revised version | 13 Mar 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |
| 3 | Revised version | 15 Mar 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |
| 4 | Revised version | 05 May 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |
| 5 | Revised version | 25 May 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |
| 6 | Revised version | 04 July 2023 | Jonathan Mart, MIOA | Daniel Clare, MIOA |

# Table of Contents

## Attachments



End of Section

# 1 Introduction

## 1.1 Instruction

RSK Acoustics (RSKA) has been instructed by Encyclis Limited to undertake a noise impact assessment in support of their environmental permit application in relation to their previously approved Energy from Waste (EFW) facility, located on Shelton Road, Corby, Northamptonshire. This report has been prepared solely in support of the Environmental Permit Application.

This report is informed by a baseline noise survey carried out between Thursday 09 February 2023 and Monday 13 February 2023, with supplementary monitoring undertaken on Tuesday 25 and Wednesday 26 April 2023.

## 1.2 Development Overview

Encyclis Limited, were granted planning permission by Northampton County Council on 04 October 2019 (ref: 19/00027/WASFUL) for the construction of an Energy Recovery Facility comprising proven combustion technology with an education visitor centre, access landscaping and associated works. Variation of the planning application (ref: 20/00048/WASVOC) was sought and approved on 29 January 2021 to amend the buildings, elevations and layout to accommodate the facility as a single line plant.

The following particulars of the facility are pertinent to this assessment:

- 357,048 tonnes per annum (tpa) capacity;
- Generate up to 30.76 Mwe (megawatts electrical gross);
- Exhaust stack height of 75 metres;
- Building heights up to 49.9 metres;
- Building footprint of 9,490 sqm.

The facility will operate over 24 hours a day, 7 days a week. Various activities operate during daytime hours only, details of which are included later in this report. Facility noise sources, numbers of HGV movements and operational scenarios, have been provided by the Encyclis.

Access to the site would utilise the existing (previous) site access off Shelton Road. HGV loading at the site will be undertaken along the western and northern areas of the building, with car parking proposed to the east (adjacent to the site entrance).

## 1.3 Site Location and Description

The EFW facility is located off Shelton Road, to the north-east of Willowbrook Industrial Estate, Corby (centred on approximate National Grid Reference 490919E, 290857N). The site is currently unoccupied, and consists of an unused area of hardstanding, formerly used as a car

park. The area directly to the west and south-west is currently still in use as a car park associated with the adjacent used car dealership, with Shelton Road bounding the site to the east. The area surrounding the proposed site location includes further industrial / commercial units in all compass point directions, the A43 and A427.

The closest noise sensitive receptors are located beyond 850 metres from the site and in many cases, substantially screened by existing commercial / industrial premises within the wider industrial estate. Those identified noise sensitive receptors are identified in the table below, along with an indication of the distance to the centre point of the EFW facility:

| Ref. | Receptor Name | Grid Reference | Type | Distance from EFW (m)* |
|---|---|---|---|---|
| R1 | Hobby Drive | 491820E 291086N | Residential | 875 |
| R2 | Corby Business Academy | 492203E 290962N | Educational | 1,230 |
| R3 | London Road | 492331E 290401N | Residential | 1,445 |
| R4 | Larratt Road, Weldon | 492118E 289816N | Residential | 1,560 |
| R5 | Pen Green Lane | 489486E 290121N | Residential | 1,650 |
| R6 | Dunlop Close Travellers Site | 489437E 291130N | Residential | 1,560 |
| R7 | Brookfield Travellers Site | 490538E 291829N | Residential | 1,020 |

** distance from centre of EFW to receptor*

T1 Noise monitoring locations

Figure 1 presents the boundary of the EFW facility and location of the nearest identified receptors. The facility masterplan is presented in Appendix A.

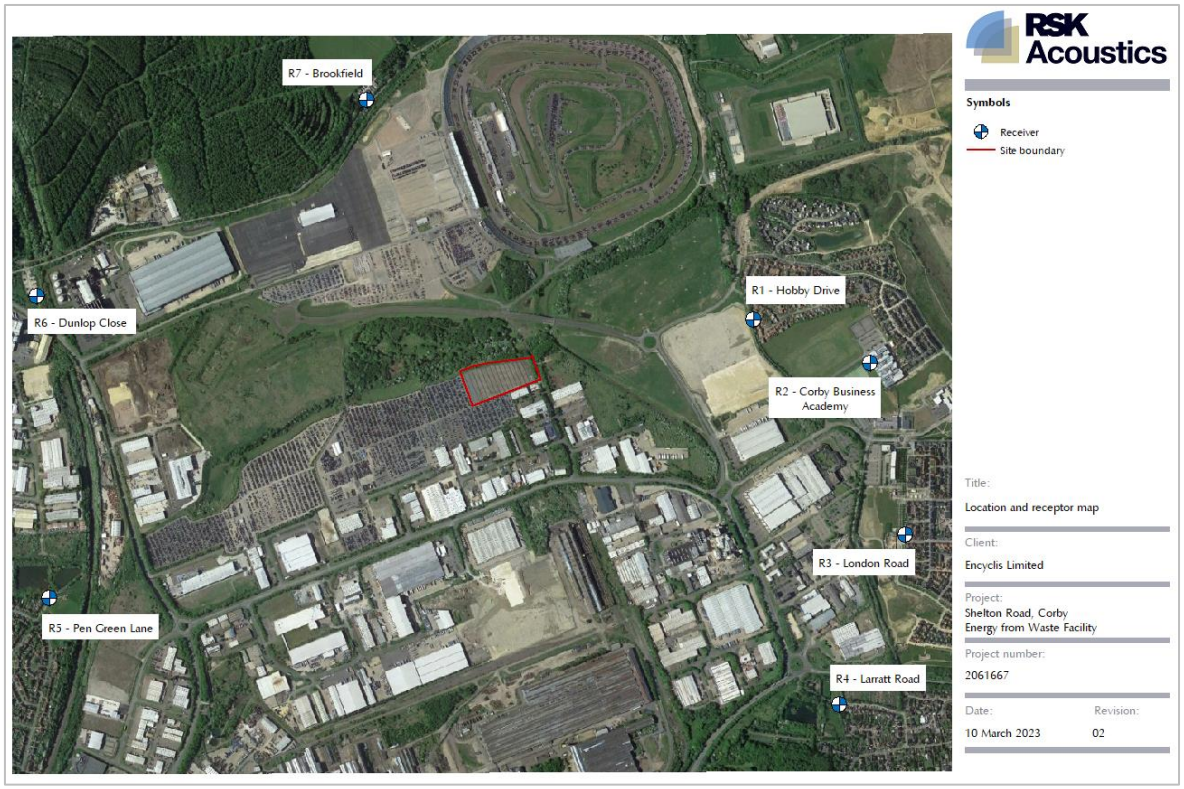



Figure 1 Site Location and Receptor Map

# 2 Legislation, Standards and Guidance

| Document | Summary |
|---|---|
| Guidance - Noise and vibration management: environmental permits, July 2021 (updated January 2022) | Assessment to be undertaken in line with the 4-step summary as identified within the Guidance.<br>This guidance replaces '*Environment Agency Horizontal Guidance for Noise (H3) Parts 1 and 2*'. |
| BS 4142:2014+A1:2019 | BS 4142 provides a method for rating industrial and commercial sound and a method for assessing resulting impacts upon people. The method is applicable to fixed plant installations, sound from industrial and manufacturing process and other associated activities.<br>The rating method takes into account specific source characteristics, such as tonality, impulsivity and intermittency. The impact assessment procedure described in BS 4142 is generally based on the comparison of the rating sound level with the background sound level prevailing at the assessment locations. |
| BS 7445-1:2003 *'Description and measurement of environmental noise'* | BS 7445 defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities. |
| BS EN IEC 60942:2018 *'Electroacoustics – sound calibrators'* | BS EN IEC 60942 specifies the performance requirements for sound calibrators. |
| BS EN 61672-1:2013 *'Electroacoustics — Sound level meters'* | BS EN 61672-1 gives electroacoustic performance specifications for sound measuring instruments. |

| Document | Summary |
|---|---|
| International Standard ISO 9613-2:*1996 'Acoustics – attenuation of sound during propagation outdoors – part 2: general method of calculation'* | The noise prediction method described in this part of the standard is general and is suitable for a wide range of engineering applications where the noise level outdoors is of interest. The noise source(s) may be moving or stationary and the method considers the following major mechanisms of noise attenuation:<br>• Geometrical divergence (also known as distance loss or geometric damping);<br>• Atmospheric absorption;<br>• Ground effect;<br>• Reflection from surfaces; and<br>• Screening by obstructions, barriers and buildings.<br><br>The method predicts noise levels under metrological conditions favourable to noise propagation from the sound source to the receiver, such as downwind propagation, or equivalently, propagation under a moderate ground-based temperature inversion as commonly occurs at night. |

T2 Legislation, Standards and Guidance

## 2.1 Consultation

Consultation with the Environment Agency was not sought prior to site attendance nor to discuss the assessment methodology. Given the extensive planning history related to the development, previous discussions had regarding the specifics of the monitoring and the intended use of the noise and vibration management guidance (issued by the Environment Agency, Natural Resources Wales, Scottish Environment Protection Agency and Northern Ireland Environment Agency) issued in July 2021 (amended Jan 2022), it was not deemed necessary to carry out that consultation for the purposes of this technical assessment.

# 3 Baseline Noise Survey

## 3.1 Methodology

A baseline noise survey has been undertaken to define the existing noise levels at the closest noise sensitive receptors to the site location. The resulting measurement data set has been used to inform the assessment.

The survey comprised of unattended noise monitoring at three fixed position locations representative of the closest noise sensitive receptors to the site between Thursday 09 February 2023 and Monday 13 February 2023, with additional attended spot roaming position monitoring at two locations (during daytime and night-time periods) between Thursday 09 February 2023 and Friday 10 February 2023. Weather data was also obtained at one receptor location using a portable Larson Davis weather station.

Additional attended spot noise monitoring was undertaken on Tuesday 25 and Wednesday 26 April 2023 at one position for a representative daytime and night-time period.

It should be noted that the EFW facility shall be located within an existing commercial / industrial area which was in operation throughout the survey period. Additional observations were undertaken as part of the baseline noise survey during both daytime and night-time periods. The measurement positions are summarised in Table 3 and presented graphically in Figure 2. Images of the equipment installations can be found in Appendix E.

| Ref. | Location | Approx. Coordinates | Measurement Type | Description |
|---|---|---|---|---|
| UL1 | Gretton Road | 491854E, 290997N | Noise – Unattended | Noise logger installed in free-field conditions adjacent to the Hobby Drive properties at a height of 1.5m above local ground level within the demise of Corby Business School |
| UL2 | Larratt Road | 492065E, 289834N | Noise – Unattended | Noise logger installed in free-field conditions to the west of properties on Larratt Road at a height of 1.5m above local ground level. It should be noted that access was not permitted to monitor at receptors; an alternative, representative position was therefore chosen based on the security of both personnel and equipment. |
| UL3 | Pen Green Lane | 489515E, 290147N | Noise – Unattended | Noise logger installed in free-field conditions to the north of properties along Pen Green Lane at the northern site boundary at a height of approximately 2.4m above local ground level (as the logger was positioned on a bank). Access was not permitted to monitor at receptors; an alternative, representative position was therefore chosen based on the security of both personnel and equipment. |
| | | 489526E, 290170N | Weather Station - Unattended | Weather station installed 20 metres to the west of the noise logger position at a height of 1.5m above local ground level. |
| AL1 | Morrisons Distribution Centre | 491697E, 290707N | Noise – Attended | Noise logger installed in free-field conditions to the immediate north-west of the distribution centre at a height of 1.5m above local ground level. |
| AL2 | Dunlop Close Travellers Site | 489422E, 291223N | Noise – Attended | Noise logger installed in free-field conditions to the immediate north-east of the travellers site at a height of 1.5m above local ground level. |
| AL3 | Brookfield Travellers Site | 490650E, 291951N | Noise – Attended | Noise logger installed in free-field conditions to the north-east of the travellers site at a height of 1.5m above local ground level. |

T3 Monitoring locations

It should be noted that access was not permitted to monitor at receptors; alternative positions were therefore chosen based on the security of both personnel and equipment. Locations chosen, albeit not within the confines of the receptor itself, were deemed as appropriate alternative locations, ones which were representative of the existing noise environment at nearest receptor(s) through observations made by RSKA.


Figure 2 Noise Monitoring Locations

## 3.2 Equipment

The equipment used is presented in Table 4.

| Equipment | Type | Serial Number | Calibration Date |
|---|---|---|---|
| Sound level meter | Rion NL-52 | 00197728 | 28/06/2021 |
| | | 00876025 | 16/11/2021 |
| | | 1265456 | 29/09/2021 |
| | | 00453835 | 10/09/2021 |
| Acoustic calibrator | Rion NC-74 | 35270126 | 24/03/2022 |

T4 Noise equipment

The sound level meters conformed to the Class 1 requirements of BS EN 61672-1:2013. The calibrator used conformed to the requirements of BS EN IEC 60942:2018. The equipment used had a calibration history that is traceable to a certified calibration institution. The calibration of the sound level meters was field checked prior to commencing measurements and prior to removing the equipment from site upon completion; no significant calibration drift was observed i.e., within a +/- 0.5 dB tolerance.

All unattended noise measurements were undertaken in free field conditions (greater than 3.5 metres from any significant reflective surfaces other than the ground).

## 3.3 Meteorological Conditions

Weather information was obtained via a Larson Davis Vantage Pro 2 weather station to determine conditions throughout the unattended noise survey duration. The weather information has been summarised in Table 5 below; the full dataset is provided in Appendix D.

| Date / Time | Temperature °C (Average) | /Precipitation / mm (Total) | Wind Speeds / m/sec (Average) | Dominant Wind Direction |
|---|---|---|---|---|
| 09/02/2023 – 12:00 | 7 | 0.0 | 2.7 | NE |
| 09/02/2023 – 18:00 | 2 | 0.0 | 1.6 | E |
| 10/02/2023 – 00:00 | 0 | 0.0 | 2.7 | NE |
| 10/02/2023 – 06:00 | 3 | 0.0 | 3.3 | NE |
| 10/02/2023 – 12:00 | 7 | 0.0 | 3.7 | NE |
| 10/02/2023 – 18:00 | 8 | 0.0 | 3.4 | NE |
| 11/02/2023 – 00:00 | 7 | 0.0 | 3.6 | E |
| 11/02/2023 – 06:00 | 7 | 0.0 | 3.5 | E |
| 11/02/2023 – 12:00 | 10 | 0.0 | 3.0 | SE |
| 11/02/2023 – 18:00 | 8 | 0.0 | 1.9 | SE |
| 12/02/2022 – 00:00 | 7 | 0.0 | 0.6 | SE |
| 12/02/2023 – 06:00 | 7 | 0.0 | 0.7 | NE |
| 12/02/2022 – 12:00 | 8 | 0.0 | 2.2 | NW |
| 12/02/2023 – 18:00 | 7 | 0.0 | 1.7 | NW |
| 13/02/2022 – 00:00 | 6 | 0.0 | 2.3 | NW |
| 13/02/2023 – 06:00 | 5 | 0.0 | 2.4 | NW |
| 13/02/2023 – 12:00 | 9 | 0.0 | 2.5 | NW |

T5 Meteorological conditions

The weather conditions were considered conducive to monitoring throughout the duration of the measurement period in February 2023. Furthermore, the weather conditions would not have impacted on those measurement locations, particularly UL2 and UL3 which were positioned within vegetation areas (for security reasons).

Weather conditions noted during attendance on 25 and 26 April 2023 were dry and calm, with a temperature during the night-time monitoring of 4°C and 10°C during the daytime. The wind speed remained below 1 $ms^{-1}$ throughout the duration of the surveys.

## 3.4 Noise Survey Observations

*UL1 (Gretton Road)*

Daytime observations included industrial noise including fixed plant noise (local commercial units) and HGV movements from Morrisons Distribution Centre. Intermittent vehicle noise along the immediate road network, with consistent vehicle noise audible from the A43. Residential movements at Hobby Drive.

The night-time noise environment was formed by audible noise from the Morrisons Distribution Centre, including plant noise and HGV movements.

*UL2 (Larratt Road)*

Daytime observations included road noise from the A43 and to a lesser extent, leaf rustle and bird song. Noise from the industrial area was barely audible due to the dominance of the A43.

The night-time noise environment was dominated by road traffic from the A43. Industrial noise was audible with HGVs using the adjacent A6116.

*UL3 (Pen Green Lane)*

The daytime noise environment consisted of various sources including road traffic (A6116 and A427), and occasional rail noise and commercial type noise from the existing industrial area to the north-east. Noise from children using a playground was also audible at the monitoring location.

During night-time hours, road noise was audible, plus operation of existing industrial units to the north.

*AL1 (Morrisons Distribution Centre):*

Attended monitoring at this location during daytime and night-time was dominated by noise sources associated with Morrisons Distribution Centre, including fixed plant and HGV movements (loading and unloading). Vehicles using the adjacent road were also audible.

*AL2 (Dunlop Close Travellers Site):*

The daytime noise environment was dominated by road traffic noise and operations at Corby Power and ADM Milling (opposite A6116). The night-time noise environment during RSKA's attendance was dominated by fixed plant noise from ADM Milling. Intermittent vehicle were noted along the A6116.

*AL3 (Brookfield Travellers Site):*

The daytime noise environment was dominated by road traffic noise along Gretton Brook Road. The night-time noise environment was noted to have limited noise sources, including one single

vehicle pass by and distant dogs barking. There were no audible plant sources during night-time attendance.

### 3.5 Survey Results – Unattended Measurements

The unattended noise survey results are presented in Tables 6 to 8 below. The noise survey results can also be found graphically in Appendix B.

*UL1 - Hobby Drive*

| Date | Time period | Noise Monitoring Results | | | |
|---|---|---|---|---|---|
| | | $L_{Aeq,T}$ dB | $L_{Amax,T}$ dB | $L_{A90,T}$ dB | $L_{A10,T}$ dB |
| Thursday 09/02/2023 | 12:00 – 23:00 | 49 | 77 | 45 | 49 |
| | 23:00 – 07:00 | 50 | 67 | 49 | 51 |
| Friday 10/02/2023 | 07:00 – 23:00 | 52 | 72 | 49 | 52 |
| | 23:00 – 07:00 | 49 | 67 | 47 | 50 |
| Saturday 11/02/2023 | 07:00 – 23:00 | 49 | 74 | 46 | 50 |
| | 23:00 – 07:00 | 44 | 66 | 41 | 45 |
| Sunday 12/02/2023 | 07:00 – 23:00 | 49 | 74 | 44 | 49 |
| | 23:00 – 07:00 | 51 | 69 | 49 | 52 |
| Monday 13/02/2023 | 07:00 – 12:00 | 52 | 78 | 47 | 52 |
| **Average Daytime Level** | | **50** | **78** | **46** | **51** |
| **Average Night-time Level** | | **48** | **69** | **46** | **49** |

*Note - $L_{Aeq,T}$ values are the logarithmic average of $L_{Aeq,15min}$ samples, and the $L_{A90,T}$ is the arithmetic average of $L_{A90,15min}$ samples respectively.*

T6 Summary of noise measurements – UL1 Hobby Drive

Averaged night-time noise levels at the monitoring location were above daytime levels on two occasions; this was the result of the increase in activity at the Morrisons Distribution Centre during the early morning period between 05:00 and 07:00. Given the site forms a material part of the existing noise environment, it is deemed pertinent to include all the measured data within

the analysis; although in order to determine the representative background noise, the higher levels associated with the increased activity at the Morrisons Distribution Centre would naturally be discounted as the intervening night-time levels (pre-05:00) form a more intrinsic part of the dataset (i.e more commonly occurring).

*UL2 – Larratt Road*

| Date | Time period | Noise Monitoring Results | | | |
|---|---|---|---|---|---|
| | | $L_{Aeq,T}$ dB | $L_{Amax,T}$ dB | $L_{A90,T}$ dB | $L_{A10,T}$ dB |
| Thursday 09/02/2023 | 12:30 – 23:00 | 55 | 82 | 52 | 57 |
| | 23:00 – 07:00 | 52 | 70 | 47 | 53 |
| Friday 10/02/2023 | 07:00 – 23:00 | 56 | 80 | 52 | 57 |
| | 23:00 – 07:00 | 48 | 65 | 40 | 51 |
| Saturday 11/02/2023 | 07:00 – 23:00 | 53 | 76 | 48 | 54 |
| | 23:00 – 07:00 | 44 | 66 | 34 | 47 |
| Sunday 12/02/2023 | 07:00 – 23:00 | 51 | 73 | 44 | 52 |
| | 23:00 – 07:00 | 47 | 82 | 36 | 47 |
| Monday 13/02/2023 | 07:00 – 13:00 | 52 | 74 | 49 | 54 |
| **Average Daytime Level** | | **53** | **82** | **49** | **55** |
| **Average Night-time Level** | | **48** | **82** | **39** | **49** |

*Note - $L_{Aeq,T}$ values are the logarithmic average of $L_{Aeq,15min}$ samples, and the $L_{A90,T}$ is the arithmetic average of $L_{A90,15min}$ samples respectively.*

T7 Summary of noise measurements – UL2 Larratt Road

*UL3 – Pen Green Lane*

| Date | Time period | Noise Monitoring Results | | | |
|---|---|---|---|---|---|
| | | $L_{Aeq,T}$ dB | $L_{Amax,T}$ dB | $L_{A90,T}$ dB | $L_{A10,T}$ dB |
| Thursday 09/02/2023 | 13:15 – 23:00 | 48 | 72 | 45 | 49 |
| | 23:00 – 07:00 | 46 | 67 | 43 | 47 |
| Friday 10/02/2023 | 07:00 – 23:00 | 48 | 74 | 45 | 49 |
| | 23:00 – 07:00 | 44 | 70 | 40 | 45 |
| Saturday 11/02/2023 | 07:00 – 23:00* | 50 | 78 | 44 | 49 |
| | 23:00 – 07:00 | 47 | 68 | 41 | 49 |
| Sunday 12/02/2023 | 07:00 – 23:00 | 49 | 77 | 41 | 49 |
| | 23:00 – 07:00 | 46 | 71 | 37 | 45 |
| Monday 13/02/2023 | 07:00 – 13:15 | 51 | 79 | 46 | 52 |
| **Average Daytime Level** | | **49** | **79** | **44** | **50** |
| **Average Night-time Level** | | **46** | **71** | **40** | **46** |

** 2-hour period between 08:00 and 10:00 removed from analysis due to abnormally high levels of in excess of 60 dB(A) which were inconsistent with preceding and post dataset.*
*Note - $L_{Aeq,T}$ values are the logarithmic average of $L_{Aeq,15min}$ samples, and the $L_{A90,T}$ is the arithmetic average of $L_{A90,15min}$ samples respectively.*

T8 Summary of noise measurements – UL3 Pen Green Lane

## 3.6 Survey Results – Attended Measurements

*AL1 – Courier Road (Morrisons)*

| Date | Time Period | Noise Monitoring Results | | | |
|---|---|---|---|---|---|
| | | $L_{Aeq,T}$ dB | $L_{Amax,T}$ dB | $L_{A90,T}$ dB | $L_{A10,T}$ dB |
| 09/02/2023 | 13:45 - 14:45 | 57 | 73 | 49 | 61 |
| 09/02/2023 | 14:45 - 15:45 | 58 | 75 | 52 | 62 |
| 10/02/2023 | 00:35 - 01:35 | 55 | 78 | 50* | 64 |

** 15-minute levels ranged between 50 and 51 dB throughout the survey*

T9 Summary of noise measurements – AL1 Courier Road (Morrisons)

*AL2 – Dunlop Close Travellers Site*

| Date | Time Period | Noise Monitoring Results | | | |
|---|---|---|---|---|---|
| | | $L_{Aeq,T}$ dB | $L_{Amax,T}$ dB | $L_{A90,T}$ dB | $L_{A10,T}$ dB |
| 09/02/2023 | 10:35 - 11:35 | 69 | 92 | 56 | 73 |
| 09/02/2023 | 11:35 - 12:35 | 70 | 100 | 56 | 72 |
| 10/02/2023 | 01:55 - 02:55 | 54 | 74 | 53* | 55 |

** 15-minute levels remained constant throughout the survey*

T10 Summary of noise measurements – AL2 Dunlop Close Travellers Site

*AL3 – Brookfield Travellers Site*

| Date | Time Period | Noise Monitoring Results | | | |
|---|---|---|---|---|---|
| | | $L_{Aeq,T}$ dB | $L_{Amax,T}$ dB | $L_{A90,T}$ dB | $L_{A10,T}$ dB |
| 25/04/2023 | 01:23 - 02:22 | 33 | 63 | 31* | 34 |
| 26/04/2023 | 11:36 - 12:35 | 66 | 98 | 48 | 64 |
| 26/04/2023 | 12:36 - 13:35 | 68 | 99 | 46 | 64 |

** 15-minute levels remained constant throughout the survey*

T11 Summary of noise measurements – AL3 Brookfield Travellers Site

## 3.7 Statistical Analysis

Statistical analysis has been undertaken on the measured background noise levels ($L_{A90,T}$) to establish a representative value for the BS 4142 assessment. Appendix C illustrates this analysis for the daytime and night-time periods respectively and Table 12 presents the result of the final background noise levels that have been utilised as part of the BS 4142 assessment for the considered noise sensitive receptors.

## 3.8 Background Noise Levels at Noise Sensitive Receptors

The adopted background noise levels at the considered noise sensitive receptors are provided in Table 12 below.

| Noise Sensitive Receptor | Representative Monitoring Location | Day time (07:00 – 23:00), $L_{A90,T}$ dB | Night Time (23:00 – 07:00), $L_{A90,T}$ dB |
|---|---|---|---|
| R1 - Hobby Drive | UL1 | 45 | 41 |
| R2 - Corby Business Academy | UL1 | 45 | 41 |
| R3 - London Road | UL1 | 45 | 41 |
| R4 - Larratt Road, Weldon | UL2 | 45 | 33 |
| R5 - Pen Green Lane | UL3 | 42 | 37 |
| R6 - Dunlop Close Travellers Site | AL2 | 56 | 53 |
| R7 - Brookfield Travellers Site | AL3 | 46 | 31 |

*Note: Background noise levels are all given as free-field levels.*

T12 Adopted Background Noise Levels

Adopted representative background noise levels have been chosen based on the results of the statistical analysis of the spread of the data set, within the existing industrial/commercial setting. It would be unrepresentative to merely chose the singular lowest value in this regard as the existing premises across the adjacent commercial areas, form a material part of the existing noise environment. Representative background levels ($L_{A90,T}$) adopted for each receptor are broadly 20% of the cumulative data obtained, allowing for the fluctuation in residual noise levels. At all receptors, the adopted background noise levels are below the averaged background noise levels (daytime and night) at each measurement position. Adopted background levels are therefore considered robust and suitable for assessment purposes.

# 4 Modelling and Prediction

## 4.1 Modelling Methodology

A number of proprietary and well proven software packages are available that can be programmed to conform to recognised source noise calculations and propagation calculations. Noise predictions presented in this report have been carried out using Soundplan v8.2, utilising the algorithms within International Standard ISO 9613-2:1996.

## 4.2 Parameters

An overview of the modelling parameters are provided in Table 13.

| Item | Setting |
|---|---|
| Algorithms | International Standard: ISO 9613-2:1996<br>British Standard: BS 12354-4: 2017 |
| External Buildings | Building heights obtained from: https://buildingheights.emu-analytics.net/ |
| Ground Absorption | Hard, acoustically reflective ground (0.1 coefficient for all ground cover) |
| Façade Correction | Free-field noise predictions have been given. |
| Meteorological Conditions | 10 degrees Celsius;<br>70% humidity; and<br>Wind from source to receiver. |
| Receptor Height | Daytime - ground floor level set at 1.5m above ground level.<br>Night – first floor level set at 4m above ground level |
| Source Modelling | Noise source data<br>See Sections 4.5 and 4.6<br>Buildings / facades<br>Lw outside = Li+Cd-R (Li = sound level inside, Cd = diffuse parameter as -5dB, R = reduction for cladding / louvre / door) |
| Terrain | DEFRA 1m terrain data has been imported into the model. |
| Assessment Period | Daytime period 07:00 – 23:00 (1 hour) / night-time period 23:00 – 07:00 (15-minutes) |

T13 Modelling parameters

## 4.3 EfW Building Parameters

An overview of the modelling inputs for the facility building are provided in Table 14.

| Item | Setting |
|---|---|
| Building Heights | Tipping Hall / Admin Building – min. 16.5m, max. 18.5m<br>Bunker Hall – min. 40m, max 48.75m<br>Control Room – 23m<br>Boiler House – min. 47.5m, max. 49.9m<br>Ash Loading Annex – 10m<br>FGT Building – min. 37m, max. 39.5m<br>FGT Silos – 21.5m<br>Stack – 75m<br>Turbine Hall – 23m<br>*Note – buildings modelled at their maximum height* |
| EfW Coordinates | North-east – 491029E, 290927N<br>South-east – 491049E, 290878N<br>South-west – 490895E, 290807N<br>North-west – 490872E, 290866N |
| Source Coordinates - ACCs | Condenser 1 (NW) – 490895E, 290830N<br>Condenser 2 (N) – 490909E, 290836N<br>Condenser 3 (NE) – 490923E, 290842N<br>Condenser 4 (SW) – 490900E, 290817N<br>Condenser 5 (S) – 490914E, 290823N<br>Condenser 6 (SE) – 490929E, 290828N |
| Site Layout | The proposed facility layout (Ref: Plot plan, ref: 112101-00-YF-GDA-SNL-001 provided by Fichtner (Encyclis' technical advisor) dated 31 January 2023. |

T14 EfW building parameters

Screenshots of the 3D model during a normal and OTNOC scenario are provided in Figures 3 and 4 below:

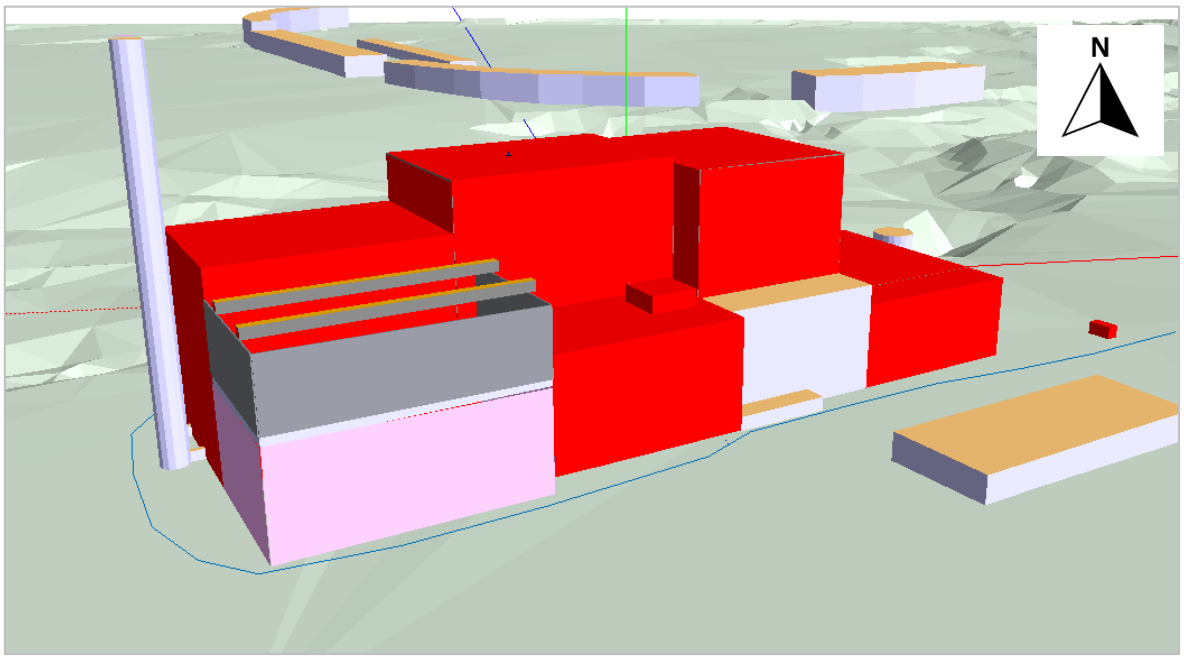



Figure 3 3D image of noise model – normal operating conditions

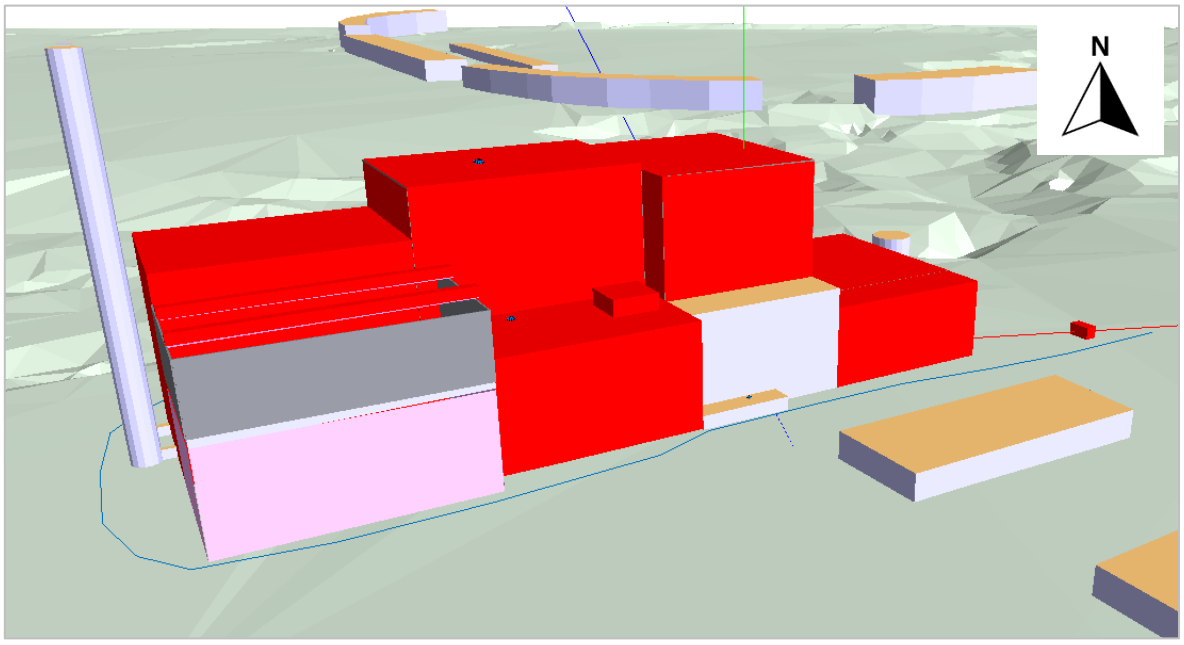



Figure 4 3D image of noise model – other than normal operating conditions

## 4.4 Operational Scenarios

Through discussions with Encyclis, the noise modelling has accounted for four separate scenarios, the details are provided below:

| No. | Scenario | Noise Sources | Frequency |
|---|---|---|---|
| 0 | Normal operating conditions | Normal | Continuous |
| 1 | Fire pump testing | Normal + FP testing | Weekly – 30mins daytime |
| 2 | Emergency diesel generator testing | Normal + EDG testing | Monthly – 30mins daytime |
| 3 | Other than normal operating conditions (OTNOC) | Normal + OTNOC | Varies – refer to Table 18 |

T15 Operating scenarios

## 4.5 Source Noise Data

The proposed equipment which has been incorporated within the noise model have been presented below in Tables 16 - 18. It should be noted that the noise levels have been provided by Encyclis. Source levels have been split accordingly:

- IRSPL – internal reverberant sound pressure level within buildings;
- SPL – sound pressure level at a known distance from the source;
- SWL – sound power level of the source.

| Area | No. | Source | Cladding Type | Period | Frequency, Hz | | | | | | | | | A | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| Tipping Hall | 1 | Façade | A | 07:00 – 19:00 | 89.0 | 89.0 | 89.0 | 82.0 | 79.0 | 79.0 | 79.0 | 70.0 | 76.0 | 85.3 | IRSPL |
| | 2 | Roof | A | 07:00 – 19:00 | 89.0 | 89.0 | 89.0 | 82.0 | 79.0 | 79.0 | 79.0 | 70.0 | 76.0 | 85.3 | IRSPL |
| | 3 | Louvre | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 4 | Door (82.5 m2 on north elevation) | B | Door open from 07:00 - 16:00 | 89.0 | 89.0 | 89.0 | 82.0 | 79.0 | 79.0 | 79.0 | 70.0 | 76.0 | 85.3 | IRSPL |
| | 5 | Roof Vent | A | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Bunker Hall | 6 | Façade | A | 24 hours | 89.0 | 89.0 | 89.0 | 82.0 | 79.0 | 79.0 | 79.0 | 70.0 | 76.0 | 85.3 | IRSPL |
| | 7 | Roof | A | 24 hours | 89.0 | 89.0 | 89.0 | 82.0 | 79.0 | 79.0 | 79.0 | 70.0 | 76.0 | 85.3 | IRSPL |
| | 8 | Louvre | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | 9 | Door | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Boiler House | 10 | Façade | A | 24 hours | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| | 11 | Roof | A | 24 hours | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| | 12 | Blowdown tank steam vent (@ 1m) | -- | 24 hours | 69.0 | 64.0 | 61.0 | 61.0 | 69.0 | 75.0 | 74.0 | 73.0 | 68.0 | 80.1 | SPL @ 1m |
| | 13 | Louvre (56 m2 on both of north and south elevation) | C | 24 hours | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| | 14 | Door (16 m2 north elevation) | B | Normally closed | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| Ash Loading Annex | 15 | Façade | A | 24 hours | 86.0 | 85.0 | 77.0 | 71.0 | 71.0 | 69.0 | 68.0 | 68.0 | 59.0 | 75.4 | IRSPL |
| | 16 | Vent (750mm x 750mm at ca. 10m level) | C | 24 hours | 86.0 | 85.0 | 77.0 | 71.0 | 71.0 | 69.0 | 68.0 | 68.0 | 59.0 | 75.4 | IRSPL |
| | 17 | Roof | A | 24 hours | 86.0 | 85.0 | 77.0 | 71.0 | 71.0 | 69.0 | 68.0 | 68.0 | 59.0 | 75.4 | IRSPL |

| Area | No. | Source | Cladding Type | Period | Frequency, Hz | | | | | | | | | A | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| | 18 | Door (18 m2 x 2) | B | Door open from 07:00 - 17:00 | 86.0 | 85.0 | 77.0 | 71.0 | 71.0 | 69.0 | 68.0 | 68.0 | 59.0 | 75.4 | IRSPL |
| FGT Building | 19 | Façade | A | 24 hours | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| | 20 | Roof | A | 24 hours | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| | 21 | Louvre (28 m2 on west elevation, 40 m3 on south elevation, 20 m2 on north elevation) | C | 24 hours | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| | 22 | Door (16 m2 north elevation) | B | Normally closed | 86.0 | 86.0 | 83.0 | 83.0 | 82.0 | 78.0 | 78.0 | 77.0 | 71.0 | 85.2 | IRSPL |
| FGT Silos | 23 | Top of silos (cladded screen on 3 sides) | D | 24 hours | 86.0 | 87.0 | 85.0 | 83.0 | 82.0 | 78.0 | 78.0 | 76.0 | 70.0 | 84.9 | SPL @ 1m |
| Stack | 24 | Emission Point | -- | 24 hours | 109.0 | 104.0 | 91.0 | 84.0 | 70.0 | 69.0 | 67.0 | 69.0 | 77.0 | 83.1 | SWL |
| Turbine Hall | 25 | Façade | A | 24 hours | 87.5 | 84.5 | 89.5 | 87.5 | 89.0 | 90.0 | 89.9 | 84.5 | 79.0 | 95.0 | IRSPL |
| | 26 | Roof | A | 24 hours | 87.5 | 84.5 | 89.5 | 87.5 | 89.0 | 90.0 | 89.9 | 84.5 | 79.0 | 95.0 | IRSPL |
| | 27 | Louvre (42 m2 on south elevation) | B | 24 hours | 87.5 | 84.5 | 89.5 | 87.5 | 89.0 | 90.0 | 89.9 | 84.5 | 79.0 | 95.0 | IRSPL |
| | 28 | Door (18 m2 on south elevation) | E | Normally closed | 87.5 | 84.5 | 89.5 | 87.5 | 89.0 | 90.0 | 89.9 | 84.5 | 79.0 | 95.0 | IRSPL |
| Turbine Exhaust Duct | 29 | Duct between turbine hall and ACC | -- | 24 hours | 86.0 | 81.0 | 78.0 | 78.0 | 86.0 | 92.0 | 91.0 | 90.0 | 85.0 | 97.1 | SWL |
| Air Cooled Condenser | 30 | Noise from each of 6 fans (value is per fan) | -- | 24 hours | 95.0 | 95.0 | 93.0 | 91.0 | 89.0 | 86.0 | 81.0 | 75.0 | 66.0 | 92.0 | SWL |
| | 31 | Condensate pumps (1 duty) , @ 1m | -- | 24 hours | 87.0 | 86.0 | 83.0 | 79.0 | 75.0 | 74.0 | 73.0 | 67.0 | 59.0 | 80.2 | SPL @ 1m |

| Area | No. | Source | Cladding Type | Period | Frequency, Hz | | | | | | | | | A | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| Fin Fan Cooler | 32 | Total noise | -- | 24 hours | 98.0 | 99.0 | 94.0 | 91.0 | 91.0 | 91.0 | 85.0 | 75.0 | 65.0 | 95.0 | SWL |
| Transformer | 33 | Total noise | -- | 24 hours | 74.0 | 68.0 | 69.0 | 68.0 | 70.0 | 61.0 | 58.0 | 53.0 | 46.0 | 71.1 | SPL @ 5m |
| Admin Building | 34 | Façade | -- | 24 hours | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45.0 | IRSPL |
| | 35 | Roof | -- | 24 hours | -- | -- | -- | -- | -- | -- | -- | -- | -- | 45.0 | IRSPL |
| Vehicles | 36 | Sound power level from HGVs to / from site (from EIA) | -- | 07:00 - 17:00 | 120.0 | 113.0 | 108.0 | 107.0 | 104.0 | 102.0 | 101.0 | 96.0 | 90.0 | 108.0 | SWL |

T16 Source data – Normal operating conditions

| Area | No. | Source | Cladding Type | Period | Frequency, Hz | | | | | | | | | A | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | | |
| Fire Pump Building | 37 | Diesel engine pump | A | 30mins / week | 84.0 | 98.0 | 101.0 | 97.0 | 99.0 | 100.0 | 99.0 | 94.0 | 86.0 | 105.1 | IRSPL |
| EDG | 38 | Emergency diesel generator | -- | 30mins / month | 96.0 | 91.0 | 85.0 | 83.0 | 78.0 | 72.0 | 73.0 | 71.0 | 65.0 | 82.0 | SPL @ 1m |

T17 Source data – Routine testing

| Area | No. | Source | Cladding Type | Period* | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | A | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Boiler House - roof | 39 | Start up vent | -- | 2 to 4 times per year for <8 hours | -- | -- | -- | -- | -- | 80.0 | -- | -- | -- | -- | SPL @ 1m |
| | 40 | Relief vent | -- | 1 per year for <1 hour | -- | -- | -- | -- | -- | 80.0 | -- | -- | -- | -- | SPL @ 1m |
| | 41 | Feedwater tank relief | -- | <1 per year for < 1 hour | -- | -- | -- | -- | -- | 80.0 | -- | -- | -- | -- | SPL @ 1m |
| | 42 | Deaerator outlet vent pipe | -- | <1 per year for < 1 hour | -- | -- | -- | 80.0 | -- | -- | -- | -- | -- | -- | SPL @ 1m |
| | 43 | Desuperheater steam start-up outlet | -- | 2 to 4 times per year for <1 hour | -- | -- | -- | 80.0 | -- | -- | -- | -- | -- | -- | SPL @ 1m |
| | 44 | Superheater steam start-up exhaust | -- | 2 to 4 times per year for <1 hour | -- | -- | -- | -- | -- | 80.0 | -- | -- | -- | -- | SPL @ 1m |
| Turbine Hall | 45 | Turbine bypass valve | -- | 2 to 4 times per year for <8 hours | 97.5 | 94.5 | 99.5 | 97.5 | 99.0 | 100.0 | 99.9 | 94.5 | 89.0 | 105.0 | IRSPL |
| Turbine Hall - roof | 46 | Hogging ejector vent | -- | 2 to 4 times per year for <1 hour | -- | -- | -- | 80.0 | -- | -- | -- | -- | -- | -- | SPL @ 1m |
| | 47 | Steam turbine warm-up line | -- | 2 to 4 times per year for <8 hours | -- | -- | -- | 80.0 | -- | -- | -- | -- | -- | -- | SPL @ 1m |
| | 48 | Gland steam bypass vent | -- | 2 to 4 times per year for <8 hours | -- | -- | -- | 80.0 | -- | -- | -- | -- | -- | -- | SPL @ 1m |
| Turbine Hall - ACC | 49 | Turbine exhaust duct relief valve | -- | 1 every 10 years for <1 hour | -- | -- | -- | -- | -- | 80.0 | -- | -- | -- | -- | SPL @ 1m |

| Area | No. | Source | Cladding Type | Period* | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | A | Type |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ACC | 50 | ACC steam header during bypass and start-up | -- | 4 to 8 times per year for <8 hours | -- | -- | -- | 80.0 | -- | -- | -- | -- | -- | -- | SPL @ 1m |
| EDG | 51 | EDG exhaust | -- | 1 per year for <24 hours | 83.0 | 78.0 | 72.0 | 70.0 | 65.0 | 59.0 | 60.0 | 58.0 | 52.0 | 69.0 | SPL @ 7m |

* Estimated averages over the operational life of the plant

T18 Source data – Other than normal operating conditions

| Ref. | Cladding Type | Frequency, Hz | | | | | | | | | Rw |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 31.5 | 63 | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 | |
| A | Façade cladding | 11.0 | 14.0 | 18.5 | 21.0 | 34.5 | 39.5 | 51.2 | 60.2 | 68.8 | 35.0 |
| B | Fast acting roller shutter door | -- | 2.0 | 3.0 | 5.0 | 8.0 | 10.0 | 11.0 | 13.0 | 12.0 | 10.0 |
| C | Acoustic louvres – 300mm deep | 2.0 | 4.0 | 6.0 | 8.0 | 11.0 | 17.0 | 15.0 | 13.0 | 12.0 | 15.0 |
| D | Wall cladding | -- | 20.0 | 18.0 | 20.0 | 24.0 | 20.0 | 29.0 | 39.0 | 47.0 | 25.0 |
| E | Acoustic door | 5.0 | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 35.0 | 35.0 | 40.0 | 29.0 |

T19 Cladding type

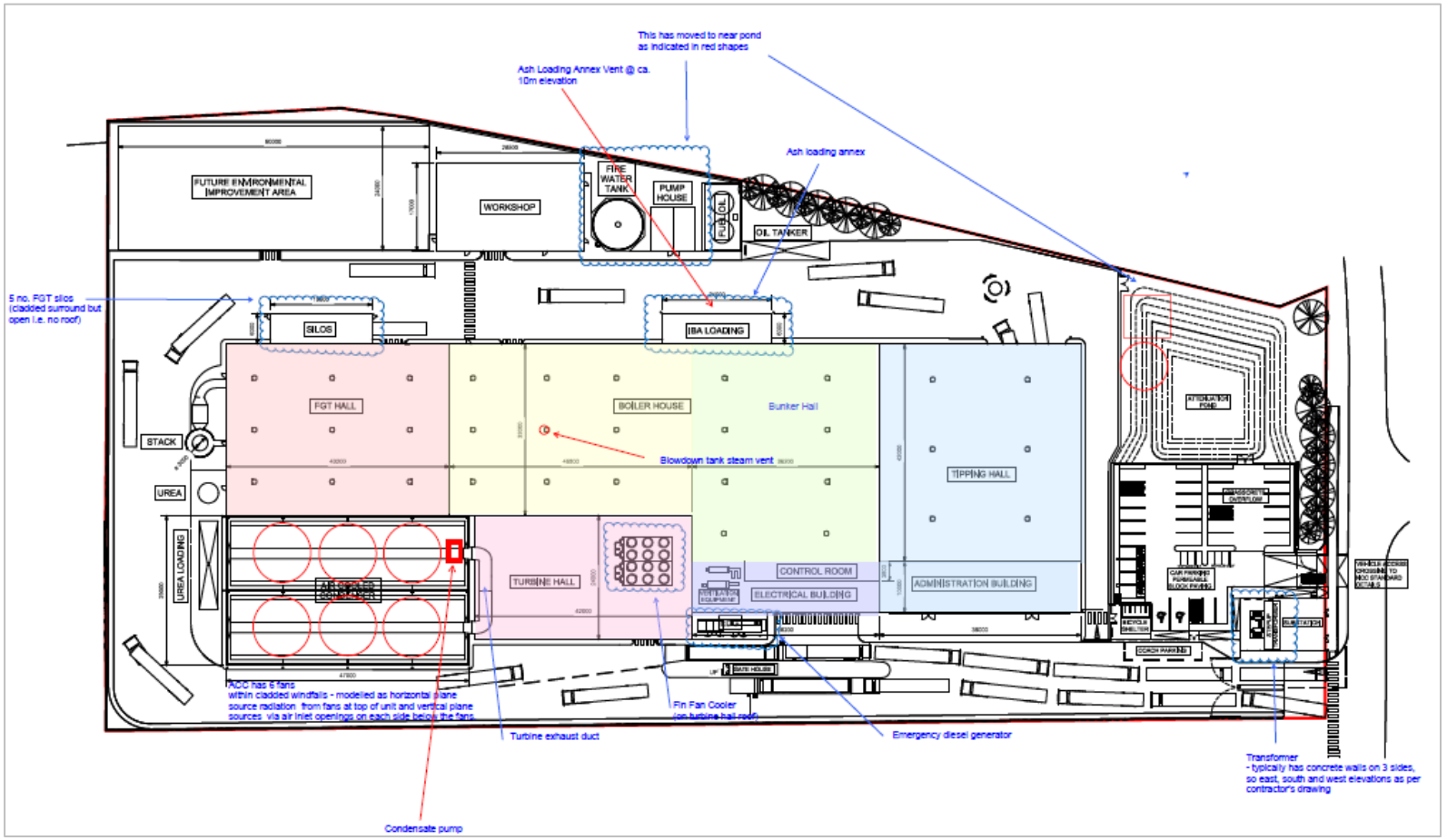



Figure 5 Annotated Site Plan (provided by Fichtner)

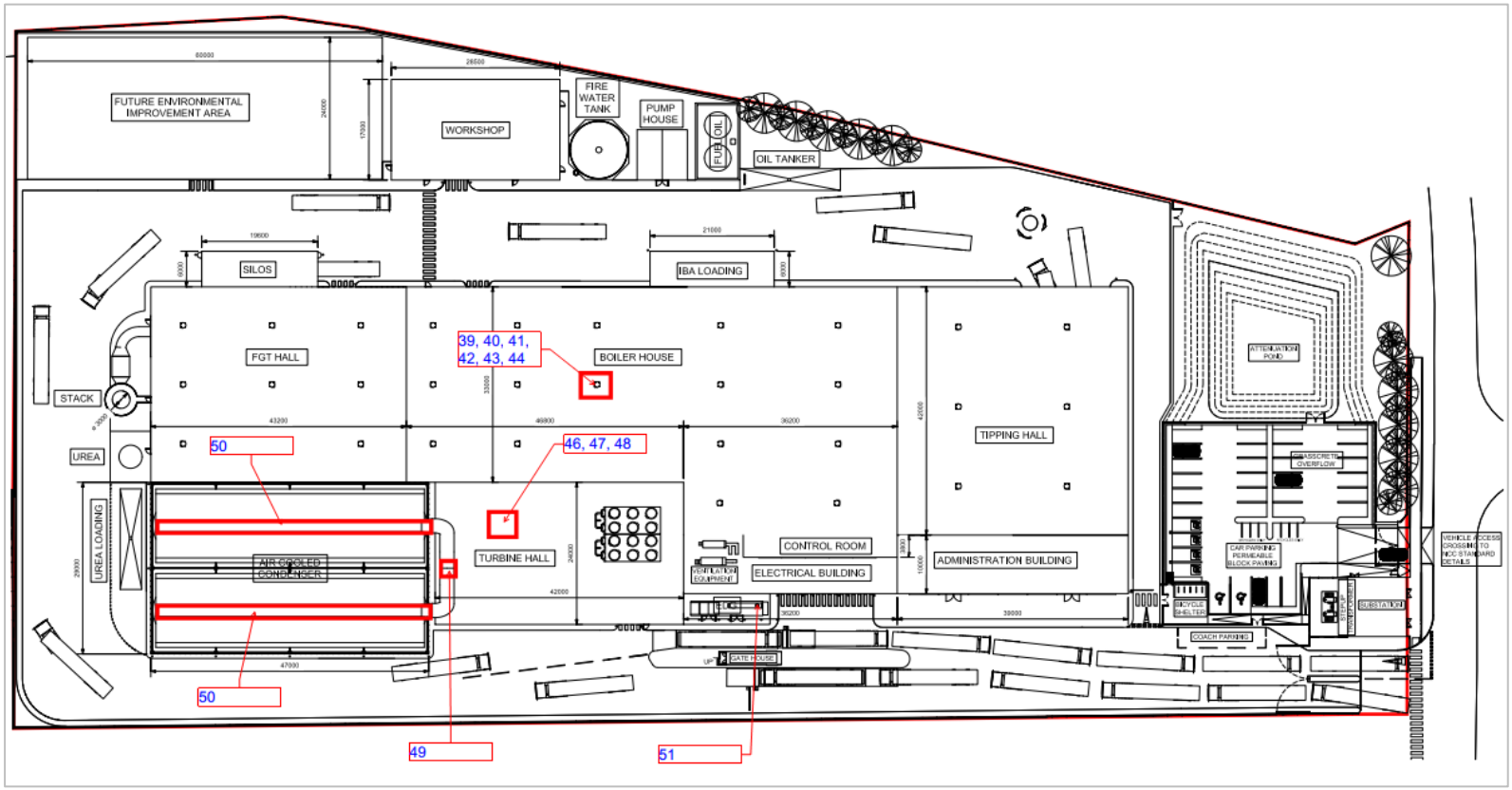



Figure 6 Annotated Site Plan showing OTNOC sources (provided by Fichtner)

## 4.6 Source Noise Data – Vehicle Movements

Deliveries (in and out) would be during daytime hours and have been evenly distributed between the hours of 07:00 – 19:00 which coincides with the periods which the tipping hall is in operation. 7 HGV vehicles (14 movements) have been assumed to enter/exit the site per hour, with HGVs emitting a sound power level of 108 dB $L_{WA}$ (noise level aligned with that used within the Environmental Statement, BS 5228 Table C11.5).

# 5 Impact Assessment – Normal Operating Conditions

## 5.1 Acoustic Correction

According to BS 4142:2014+A1: 2019, where certain features of the specific noise level can increase the significance of impact of a sound level, a character correction is applied to provide a rated noise level. The characteristics of a sound that are likely to cause an increase in the significance of impact are tonality, impulsivity, intermittency or other characteristic features such as an identifiable 'hiss'. The character corrections are applied on the basis of perceptibility at the surrounding noise receptors.

Taking the above acoustic features into consideration, the application of rating penalties is as follows:

a. Tonality – as the proposed equipment source level is to be achieved through design, it is assumed any tonal elements within the proposed installation will be mitigated sufficiently;

b. Impulsivity – the character of the sound from the proposed equipment is generally thought to be of a constant level, with no rapid change in the level or character of noise. It is therefore considered unnecessary to apply an impulsivity correction;

c. Intermittency – as the proposed equipment is steady state with no noticeable on/off characteristics, it is considered unnecessary to apply an intermittency correction; and

d. Other - where neither tonal nor impulsive corrections apply. While it is not anticipated that noise from the proposed site would be readily distinguishable at the noise sensitive receptor location, a +3 dB rating correction has been added, following the environmental permits guidance, to receptors with noise levels predicted greater than 10 dB below background (i.e. > -10 below background, or above background).

## 5.2 Operational Assessment

The rated noise level predicted at nearest noise sensitive receptors has been assessed against existing background noise levels in order to assess the likelihood for impact in accordance with BS 4142. The assessment uses the closest noise sensitive receptors to the site.

Table 20 presents the predicted free-field specific and rated noise levels alongside the measured background, which have been used to derive the level difference between background and rated levels during daytime and night-time periods. Noise contour plots depicting the propagation of noise from the site are presented in Figures 7 and 8.

| Receptor | Time Period | Representative Background Sound Level, $L_{A90,T}$ dB[1 & 2] | | Predicted Noise Level, $L_{As}$ dB | Rated Noise Level, $L_{Ar}$ dB[3] | Difference, dB |
|---|---|---|---|---|---|---|
| R1 - Hobby Drive | Day | 45 | *(50)* | 35 | 35 | -10 |
| | Night | 41 | *(48)* | 34 | 37 | -4 |
| R2 - Corby Business Academy | Day | 45 | *(50)* | 32 | 32 | -13 |
| | Night | 41 | *(48)* | 31 | 31 | -10 |
| R3 - London Road | Day | 45 | *(50)* | 26 | 26 | -19 |
| | Night | 41 | *(48)* | 26 | 26 | -15 |
| R4 - Larratt Road | Day | 45 | *(53)* | 26 | 26 | -19 |
| | Night | 33 | *(48)* | 25 | 28 | -5 |
| R5 - Pen Green Lane | Day | 42 | *(49)* | 28 | 28 | -14 |
| | Night | 37 | *(46)* | 28 | 31 | -6 |
| R6 - Dunlop Close Traveller Site | Day | 56 | *(70)* | 26 | 26 | -30 |
| | Night | 53 | *(54)* | 26 | 26 | -27 |
| R7 - Brookfield Traveller Site | Day | 46 | *(67)* | 30 | 30 | -16 |
| | Night | 31 | *(33)* | 28 | 31 | 0 |

*1 – representative background sound level accounting for 1-hour period during the daytime and 15-minutes at night, in accordance with BS 4142*
*2 – averaged ambient sound level provided in brackets ($L_{Aeq,T}$) to provide context to the representative background noise levels adopted for the assessment*
*3 – rated noise levels include a +3dB penalty for general character where predicted levels ($L_{As}$) are more than 10dB below adopted background sound level*

T20 BS 4142 assessment – normal conditions

Table 20 above shows that the predicted levels from the proposed site operations are likely to be in line with the existing background noise levels, with the lowest difference (between background sound levels and rated noise levels) of 0 dB predicted at Brookfield Traveller Site during night-time operations.

Highest rated noise levels from site operations are predicted at Hobby Drive, with levels of 35 dB $L_{Ar}$ daytime and 37 dB $L_{Ar}$ during the night.

It should be noted that the predicted rated noise levels at all receptors are below the existing ambient noise levels and therefore are unlikely to significantly contribute to the overall noise level at the noise sensitive receptors.

In accordance with BS 4142: 2014+A1: 2019, where the rating level does not exceed the background sound level, this is an indication of the development having a **low impact** on the existing (and nearest) sensitive receptors.

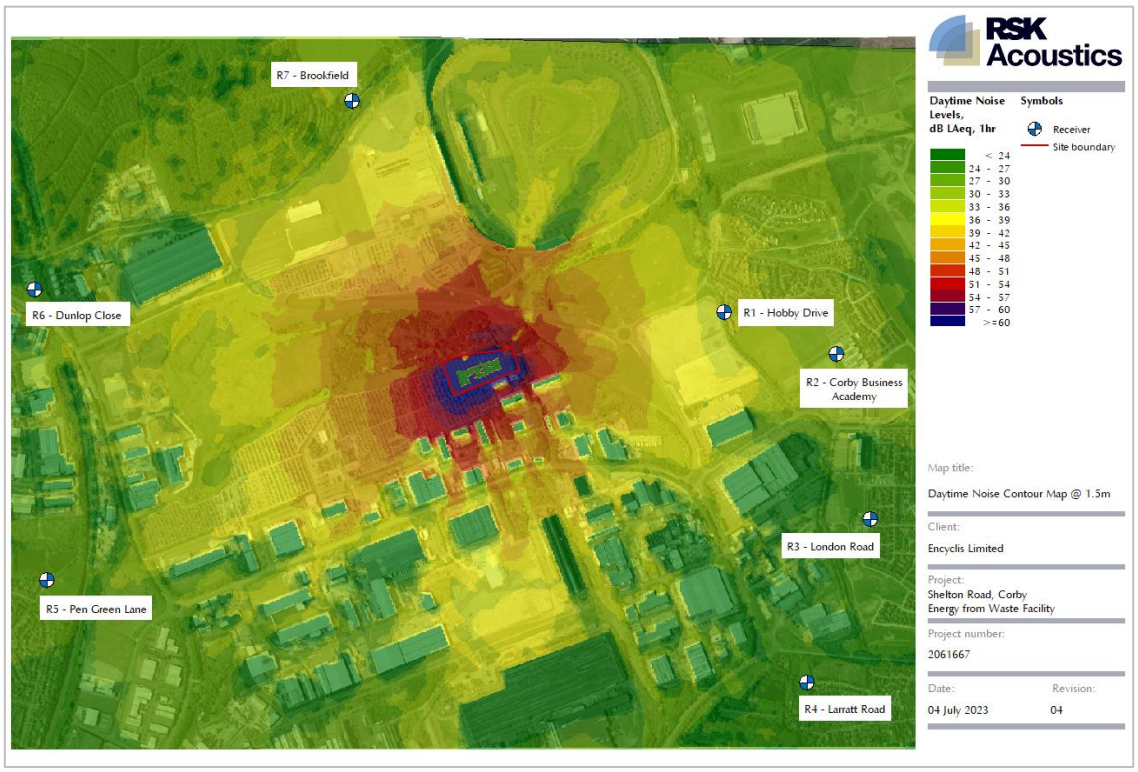



Figure 7 Noise Contour Plot – Daytime (at 1.5m height)

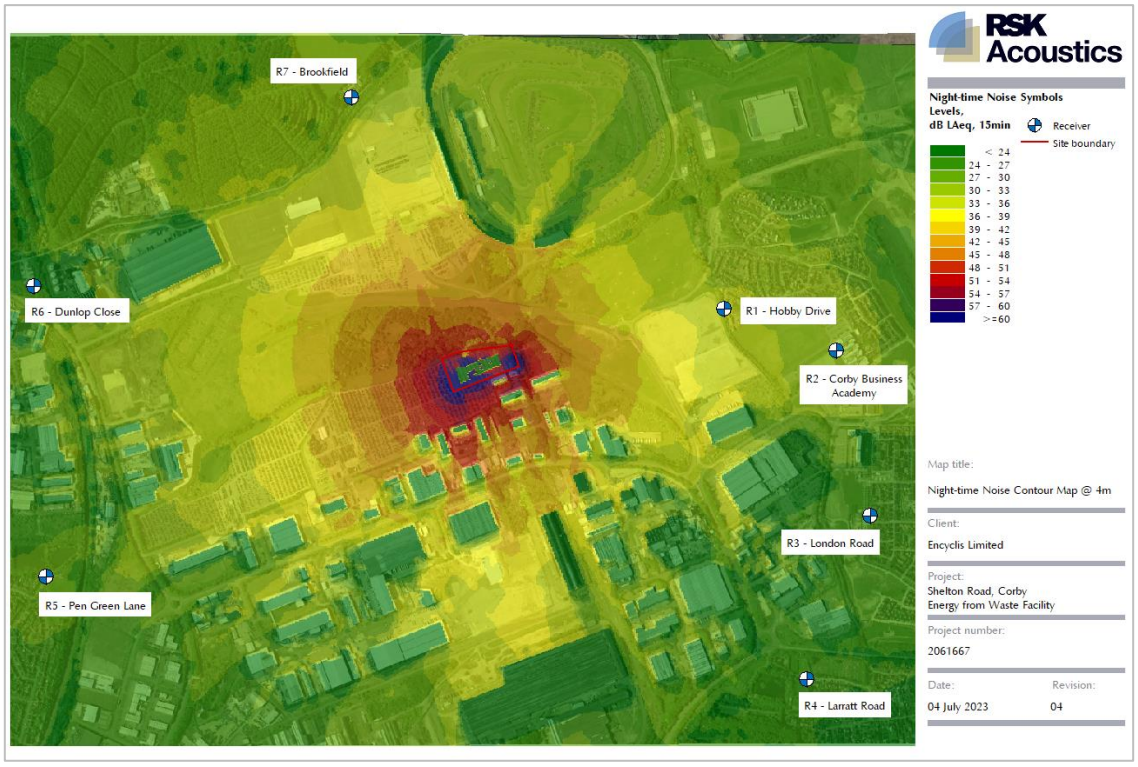



Figure 8 Noise Contour Plot – Night-time (at 4m height)

## 5.3 Uncertainty

Uncertainty has been limited where possible through the monitoring methodology and conservative assessment approach. It is considered unlikely that the uncertainty would adversely impact the assessment outcomes.

The following measures have been taken to reduce uncertainty:

- Use of monitoring equipment in accordance with section 5 of BS 4142: 2014+A1: 2019, using Class 1 instrumentation;
- Measurement procedures followed in accordance with section 6 of BS 4142: 2014+A1: 2019 with all precautions taken to minimise interference whilst maintaining the security of both personnel and equipment;
- Monitoring of background sound levels during representative periods and where shorter attended measurements were obtained, these covered likely quietest daytime and night time hours;
- Use of computer noise modelling techniques to calculate break-out noise levels using accurate design layouts and declared plant noise emissions from the client;
- Assessment of a conservative operational scenario assuming concurrent operation of all proposed fixed plant items and HGV movements; and
- Specific sound levels have been calculated to the requirements of ISO 9613-2:1996 which is the widely accepted procedure for the calculation of sound propagation, including favourable wind conditions from source to receiver.

## 5.4 Identified Noise Sources at Receptor

Based on the results of the noise modelling, the following sources contribute the highest to the predicted levels at each receptor:

| Hierarchy of Dominant Noise Sources | Noise Sensitive Receptor – Daytime | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R1 - Hobby Drive | | R2 - Corby Business Academy | | R3 - London Road | | R4 - Larratt Road, Weldon | | R5 - Pen Green Lane | | R6 - Dunlop Close Travellers Site | | R7 - Brookfield Travellers Site | |
| | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) |
| Rank 1 (highest) | HGV Route (in/out) | 28.2 | HGV Route (in/out) | 24.4 | HGV Route (in/out) | 17.7 | HGV Route (in/out) | 20.1 | HGV Route (in/out) | 22.4 | FGT Silos-Roof Silos | 23.4 | Tipping Hall-TH North Door | 23.6 |
| Rank 2 | Fin Fan Cooler-South Facade | 24.9 | Fin Fan Cooler-South Facade | 23.2 | Fin Fan Cooler-South Facade | 17.3 | Fin Fan Cooler-East Facade | 17.1 | FGT Silos-Roof Silos | 20.1 | HGV Route (in/out) | 18.5 | HGV Route (in/out) | 22.7 |
| Rank 3 | Fin Fan Cooler-East Facade | 21.9 | Fin Fan Cooler-East Facade | 22.4 | Fin Fan Cooler-East Facade | 17.3 | Fin Fan Cooler-South Facade | 16.5 | ACC West | 15.2 | Turbine exhaust duct 1-West exhaust | 14.2 | FGT Silos-Roof Silos | 22.7 |
| Rank 4 | ACC South | 21.9 | Fin Fan Cooler-West Facade | 18.9 | ACC South | 15.5 | ACC South | 15.1 | ACC South | 15 | Turbine exhaust duct 2-West exhaust | 14.2 | Turbine exhaust duct 1-West exhaust | 19.3 |
| Rank 5 | Transformer-Roof source | 21.6 | Fin Fan Cooler-Roof Source | 18.3 | Fin Fan Cooler-West Facade | 14.6 | Fin Fan Cooler-Roof Source | 14.8 | Turbine exhaust duct 1-West exhaust | 14.7 | ACC West | 13.3 | ACC West | 16.5 |
| Rank 6 | Transformer-East Facade | 21.4 | Transformer-Roof source | 17.8 | Tipping Hall-TH Roof Facade | 13.7 | Tipping Hall-TH Roof Facade | 12 | Turbine exhaust duct 2-West exhaust | 14.6 | Bunker Hall-North Facade | 10 | Transformer-Roof source | 15.4 |
| Rank 7 | Transformer-South Facade | 21.3 | ACC South | 17.8 | Turbine Hall-South Facade | 11.9 | Turbine Hall-South Facade | 11.4 | Transformer-Roof source | 12.3 | Boiler House-North Facade | 9.4 | Transformer-West Facade | 14.8 |
| Rank 8 | Fin Fan Cooler-Roof Source | 20.7 | Transformer-East Facade | 17.3 | Fin Fan Cooler-Roof Source | 11.8 | ACC East | 10.9 | Transformer-South Facade | 12 | Tipping Hall-TH North Door | 9 | Transformer-North Facade | 14.7 |
| Rank 9 | Fin Fan Cooler-West Facade | 20.4 | Transformer-South Facade | 17.2 | ACC East | 11.6 | Turbine Hall-Roof Facade | 9.7 | Transformer-West Facade | 11.9 | Boiler house tank steam vent | 8 | Bunker Hall-North Facade | 14.3 |
| Rank 10 | Turbine Hall-South Facade | 19.5 | Turbine Hall-South Louvre 1 | 16.8 | Turbine Hall-South Louvre 1 | 10.4 | Bunker Hall-East Facade | 9.6 | Fin Fan Cooler-Roof Source | 11.4 | FGT Hall-North Facade | 6.7 | Boiler House-North Facade | 12.9 |

T21 Hierarchy of noise sources – normal conditions (daytime)

| Hierarchy of Dominant Noise Sources | Noise Sensitive Receptor – Night | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R1 - Hobby Drive | | R2 - Corby Business Academy | | R3 - London Road | | R4 - Larratt Road, Weldon | | R5 - Pen Green Lane | | R6 - Dunlop Close Travellers Site | | R7 - Brookfield Travellers Site | |
| | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) |
| Rank 1 (highest) | Fin Fan Cooler-South Facade | 26 | Fin Fan Cooler-South Facade | 24 | Fin Fan Cooler-South Facade | 17.5 | Fin Fan Cooler-East Facade | 17.2 | FGT Silos-Roof Silos | 20.3 | FGT Silos-Roof Silos | 23.4 | FGT Silos-Roof Silos | 22.7 |
| Rank 2 | ACC South | 23.9 | Fin Fan Cooler-East Facade | 22.8 | Fin Fan Cooler-East Facade | 17.4 | Fin Fan Cooler-South Facade | 16.6 | Turbine exhaust duct 1-West exhaust | 16.9 | Turbine exhaust duct 1-West exhaust | 14.2 | Turbine exhaust duct 1-West exhaust | 19.3 |
| Rank 3 | Fin Fan Cooler-East Facade | 23.7 | Fin Fan Cooler-West Facade | 19 | ACC South | 15.9 | ACC South | 15.4 | Turbine exhaust duct 2-West exhaust | 16.7 | Turbine exhaust duct 2-West exhaust | 14.2 | ACC West | 16.5 |
| Rank 4 | Turbine Hall-South Louvre 3 | 22.2 | ACC South | 18.7 | Fin Fan Cooler-West Facade | 14.7 | Fin Fan Cooler-Roof Source | 15 | ACC West | 15.5 | ACC West | 13.3 | Transformer-Roof source | 15.4 |
| Rank 5 | Turbine Hall-South Louvre 1 | 22.2 | Turbine Hall-South Louvre 1 | 18.6 | Turbine Hall-South Facade | 12.2 | Turbine Hall-South Facade | 11.6 | ACC South | 15.3 | Bunker Hall-North Facade | 10 | Transformer-West Facade | 14.8 |
| Rank 6 | Turbine Hall-South Louvre 2 | 22.1 | Fin Fan Cooler-Roof Source | 18.3 | Fin Fan Cooler-Roof Source | 12.1 | ACC East | 11.1 | Condenser 5 | 12.9 | Boiler House-North Facade | 9.4 | Transformer-North Facade | 14.7 |
| Rank 7 | Transformer-Roof source | 22.1 | Transformer-Roof source | 17.7 | ACC East | 12 | Turbine Hall-Roof Facade | 9.9 | Transformer-Roof source | 12.6 | Boiler house tank steam vent | 8 | Bunker Hall-North Facade | 14.3 |
| Rank 8 | Transformer-East Facade | 21.7 | Transformer-South Facade | 17.5 | Turbine Hall-South Louvre 1 | 10.6 | Bunker Hall-East Facade | 9.7 | Condenser 1 | 12.4 | FGT Hall-North Facade | 6.7 | Boiler House-North Facade | 12.9 |
| Rank 9 | Transformer-South Facade | 21.7 | Transformer-East Facade | 17.5 | Turbine Hall-Roof Facade | 10.6 | Turbine Hall-South Louvre 3 | 9.6 | Condenser 6 | 12.3 | FGT Hall-West Facade | 6.5 | Bunker Hall-Roof Facade | 11.3 |
| Rank 10 | Fin Fan Cooler-Roof Source | 20.8 | Turbine Hall-South Louvre 2 | 16.8 | Turbine Hall-South Louvre 3 | 10.5 | Turbine Hall-South Louvre 2 | 9.6 | Transformer-South Facade | 12.3 | Boiler House-North Door | 5.4 | FGT Hall-West Facade | 11.3 |

T22 Hierarchy of noise sources – normal conditions (night)

## 5.5 Noise Control

Embedded noise control measures are provided separately in the accompanying noise management plan issued by Encyclis.

## 5.6 Fire Pump Testing (Scenario 1)

Predicted noise levels, inclusive of normal operations plus fire pump testing increase the noise level by 1 dB at R3 London Road and R6 Dunlop Close Travellers Site during the daytime (to 27 dB $L_{As}$). Rated noise levels at these locations are 18 dB (R3) and 29 dB (R6) below the representative daytime background sound level ($L_{A90,\ 1hr}$). Noise predictions at the remaining receptors remained consistent with those during a normal operating scenario (scenario 0).

## 5.7 Emergency Diesel Generator Testing (Scenario 2)

Predicted noise levels, inclusive of normal operations plus emergency diesel generator testing increase the noise level by a maximum of 2 dB at R2 Corby Business School during the daytime (to 34 dB $L_{As}$). Rated noise levels at this location are 11 dB below the representative daytime background sound level ($L_{A90,\ 1hr}$).

The operation of the emergency diesel generator increases predicted noise levels at R1 Hobby Drive, R3 London Road, R4 Larratt Road and R6 Dunlop Close Travellers Site by 1 dB. Noise predictions at the remaining receptors remained consistent with those during a normal operating scenario (scenario 0).

# 6 Impact Assessment – Other Than Normal Operating Conditions

## 6.1 OTNOC Assessment

The rated noise level predicted at nearest noise sensitive receptors has been assessed for the OTNOC scenario against existing background noise levels in order to assess the likelihood for impact in accordance with BS 4142. The assessment uses the closest noise sensitive receptors to the site and includes the cumulative impact of the normal operations (scenario 0) and those OTNOC plant items operating concurrently.

Table 23 presents the predicted free-field specific and rated noise levels alongside the measured background, which have been used to derive the level difference between background and rated levels during daytime and night-time periods.

| Receptor | Time Period | Representative Background Sound Level, $L_{A90,T}$ dB[1 & 2] | | Predicted Noise Level, $L_{As}$ dB | Rated Noise Level, $L_{Ar}$ dB[3] | Difference, dB |
|---|---|---|---|---|---|---|
| R1 - Hobby Drive | Day | 45 | *(50)* | 40 | 43 | -2 |
| | Night | 41 | *(48)* | 41 | 44 | +3 |
| R2 - Corby Business Academy | Day | 45 | *(50)* | 37 | 40 | -5 |
| | Night | 41 | *(48)* | 38 | 41 | 0 |
| R3 - London Road | Day | 45 | *(50)* | 34 | 34 | -11 |
| | Night | 41 | *(48)* | 34 | 37 | -4 |
| R4 - Larratt Road | Day | 45 | *(53)* | 34 | 34 | -11 |
| | Night | 33 | *(48)* | 34 | 37 | +4 |
| R5 - Pen Green Lane | Day | 42 | *(49)* | 33 | 36 | -6 |
| | Night | 37 | *(46)* | 33 | 36 | -1 |
| R6 - Dunlop Close Traveller Site | Day | 56 | *(70)* | 31 | 31 | -25 |
| | Night | 53 | *(54)* | 30 | 30 | -23 |
| R7 - Brookfield Traveller Site | Day | 46 | *(67)* | 32 | 32 | -14 |
| | Night | 31 | *(33)* | 30 | 33 | +2 |

*1 – representative background sound level accounting for 1-hour period during the daytime and 15-minutes at night, in accordance with BS 4142*
*2 – averaged ambient sound level provided in brackets ($L_{Aeq,T}$) to provide context to the representative background noise levels adopted for the assessment*
*3 – rated noise levels include a +3dB penalty for general character where predicted levels ($L_{As}$) are more than 10dB below adopted background sound level*

T23 BS 4142 assessment – OTNOC conditions

Table 23 above shows that the predicted levels from the proposed site operations are likely to exceed the representative background sound level during the night by a maximum of 4 dB at R4

Larratt Road. It should be noted that this is based on an absolute worst case assessment, accounting for normal conditions and all OTNOC sources operating concurrently.

Highest rated noise levels from site operations are predicted at Hobby Drive, with levels of 43 dB $L_{Ar}$ daytime and 44 dB $L_{Ar}$ during the night.

Techniques used within the ERF for minimising noise during operations other than normal operating conditions are provided separately in the accompanying noise management plan issued by Encyclis. These include the best available techniques (BAT 37) provided by the BREF.

## 6.2 Identified Noise Sources at Receptor

Based on the results of the noise modelling, Table 24 provides an itemised list of the OTNOC sources and their contribution to each receptor. It can be seen from the table that all individual sources are significantly below the representative background sound level at all receptor locations. Table 24 indicates that noise from the ACC steam headers is the highest predicted source impacting all receptors during the OTNOC scenario.

| Hierarchy of Dominant OTNOC Noise Sources | Noise Sensitive Receptor – GF | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R1 - Hobby Drive | | R2 - Corby Business Academy | | R3 - London Road | | R4 - Larratt Road, Weldon | | R5 - Pen Green Lane | | R6 - Dunlop Close Travellers Site | | R7 - Brookfield Travellers Site | |
| | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) |
| Rank 1 (highest) | OTNOC Steam Header 2-South Facade | 30.3 | OTNOC Steam Header 1-South Facade | 27.2 | OTNOC Steam Header 2-South Facade | 25.5 | OTNOC Steam Header 2-South Facade | 24.9 | OTNOC Steam Header 1-South Facade | 24.6 | OTNOC Steam Header 2-North Facade | 22.1 | OTNOC Steam Header 2-North Facade | 18.7 |
| Rank 2 | OTNOC Steam Header 1-South Facade | 30 | OTNOC Steam Header 2-South Facade | 27 | OTNOC Steam Header 1-South Facade | 24 | OTNOC Steam Header 2-Roof | 24.1 | OTNOC Steam Header 2-South Facade | 24.6 | OTNOC Steam Header 1-North Facade | 20.9 | OTNOC Steam Header 1-West Facade | 17.8 |
| Rank 3 | OTNOC - Turbine Hall-South Facade | 29.5 | OTNOC - Turbine Hall-South Louvre 1 | 26.8 | OTNOC Steam Header 2-North Facade | 23.4 | OTNOC Steam Header 1-Roof | 24.1 | OTNOC Steam Header 2-Roof | 21.5 | OTNOC Steam Header 1-Roof | 20.6 | OTNOC Steam Header 2-West Facade | 17.7 |
| Rank 4 | OTNOC - Turbine Hall-South Louvre 3 | 28.7 | OTNOC Steam Header 1-North Facade | 25.3 | OTNOC Steam Header 1-North Facade | 22.9 | OTNOC Steam Header 1-South Facade | 22.9 | OTNOC Steam Header 1-Roof | 21.5 | OTNOC Steam Header 1-South Facade | 20.6 | OTNOC Steam Header 2-Roof | 17.2 |
| Rank 5 | OTNOC - Turbine Hall-South Louvre 2 | 28.4 | OTNOC - Turbine Hall-South Facade | 25.3 | OTNOC - Turbine Hall-South Facade | 21.9 | OTNOC Steam Header 2-North Facade | 22.7 | OTNOC Steam Header 1-North Facade | 20.7 | OTNOC Steam Header 2-Roof | 19.3 | OTNOC Steam Header 2-South Facade | 15.3 |
| Rank 6 | OTNOC - Turbine Hall-South Louvre 1 | 28.3 | OTNOC Steam Header 1-Roof | 25 | OTNOC - Turbine Hall-South Louvre 1 | 20.4 | OTNOC - Turbine Hall-South Facade | 21.3 | OTNOC Steam Header 2-North Facade | 20.6 | OTNOC Steam Header 2-West Facade | 14.1 | OTNOC - BH Deaerator Outlet Vent Pipe | 15.1 |
| Rank 7 | OTNOC Steam Header 1-Roof | 27 | OTNOC - Turbine Hall-South Louvre 2 | 24.9 | OTNOC - Turbine Hall-Roof Facade | 20.3 | OTNOC Steam Header 1-North Facade | 21.3 | OTNOC Steam Header 1-West Facade | 13.8 | OTNOC Steam Header 1-West Facade | 14.1 | OTNOC - BH Desuperheater Steam Start-up | 15.1 |
| Rank 8 | OTNOC Steam Header 2-Roof | 26.9 | OTNOC - Turbine Hall-South Louvre 3 | 23.9 | OTNOC - Turbine Hall-South Louvre 3 | 20.2 | OTNOC - Turbine Hall-Roof Facade | 19.7 | OTNOC Steam Header 2-West Facade | 13.8 | OTNOC - BH Deaerator Outlet Vent Pipe | 12.9 | OTNOC Steam Header 1-North Facade | 14.8 |
| Rank 9 | OTNOC Steam Header 2-North Facade | 26.2 | OTNOC Steam Header 2-Roof | 23.7 | OTNOC Steam Header 1-Roof | 20.2 | OTNOC - Turbine Hall-South Louvre 3 | 19.4 | OTNOC - BH Deaerator Outlet Vent Pipe | 12.3 | OTNOC - BH Desuperheater Steam Start-up | 12.8 | OTNOC Steam Header 1-South Facade | 14 |
| Rank 10 | OTNOC Steam Header 1-North Facade | 26.1 | OTNOC Steam Header 2-North Facade | 22.5 | OTNOC - Turbine Hall-South Louvre 2 | 20.1 | OTNOC - Turbine Hall-South Louvre 2 | 19.4 | OTNOC - BH Desuperheater Steam Start-up | 12.3 | OTNOC Steam Header 2-South Facade | 10 | OTNOC Steam Header 1-Roof | 13.7 |
| Rank 11 | OTNOC - Turbine Hall-Roof Facade | 23.4 | OTNOC - Turbine Hall-Roof Facade | 22 | OTNOC Steam Header 2-Roof | 18.2 | OTNOC - Turbine Hall-South Louvre 1 | 19.3 | OTNOC - Turbine Hall-Roof Facade | 10.4 | OTNOC - BH Start up vent | 8.6 | OTNOC Steam Header 2 - Underneath | 10.7 |
| Rank 12 | OTNOC - EDG Exhaust | 22.6 | OTNOC - EDG Exhaust | 19.6 | OTNOC Steam Header 2-East Facade | 16.9 | OTNOC Steam Header 2-East Facade | 16.2 | OTNOC - Turbine Hall-South Louvre 3 | 9.4 | OTNOC - BH Relief Vent | 8.6 | OTNOC Steam Header 1 - Underneath | 9.7 |

| Hierarchy of Dominant OTNOC Noise Sources | Noise Sensitive Receptor – GF | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R1 - Hobby Drive | | R2 - Corby Business Academy | | R3 - London Road | | R4 - Larratt Road, Weldon | | R5 - Pen Green Lane | | R6 - Dunlop Close Travellers Site | | R7 - Brookfield Travellers Site | |
| | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) |
| Rank 13 | OTNOC - TH Hogging Ejector Vent | 19.6 | OTNOC - TH Hogging Ejector Vent | 17.6 | OTNOC Steam Header 1-East Facade | 16.9 | OTNOC Steam Header 1-East Facade | 16.2 | OTNOC - Turbine Hall-South Facade | 9.2 | OTNOC - BH Feedwater Tank Relief | 8.6 | OTNOC - BH Superheater Steam Start-up | 9.2 |
| Rank 14 | OTNOC - TH Steam Turbine Warm up Line | 19.5 | OTNOC - TH Steam Turbine Warm up Line | 17.6 | OTNOC - TH Hogging Ejector Vent | 16.3 | OTNOC - TH Gland Steam Bypass Vent | 15.2 | OTNOC - Turbine Hall-South Louvre 2 | 8.6 | OTNOC - BH Superheater Steam Start-up | 8.5 | OTNOC - BH Start up vent | 9.2 |
| Rank 15 | OTNOC - TH Gland Steam Bypass Vent | 19.5 | OTNOC - TH Gland Steam Bypass Vent | 17.6 | OTNOC - TH Steam Turbine Warm up Line | 16.3 | OTNOC - TH Steam Turbine Warm up Line | 15.2 | OTNOC - BH Start up vent | 8 | OTNOC Steam Header 1 - Underneath | 5.7 | OTNOC - BH Relief Vent | 9.2 |
| Rank 16 | OTNOC Steam Header 2-East Facade | 19.3 | OTNOC Steam Header 1-East Facade | 17 | OTNOC - TH Gland Steam Bypass Vent | 16.3 | OTNOC - TH Hogging Ejector Vent | 15.2 | OTNOC - BH Relief Vent | 8 | OTNOC - Turbine Hall-South Facade | 3.1 | OTNOC - BH Feedwater Tank Relief | 9.2 |
| Rank 17 | OTNOC Steam Header 1-East Facade | 19.3 | OTNOC Steam Header 2-East Facade | 16.4 | OTNOC - TH Turbine Exhaust Relief Valve | 12.4 | OTNOC - BH Desuperheater Steam Start-up | 12.6 | OTNOC - BH Superheater Steam Start-up | 8 | OTNOC - Turbine Hall-Roof Facade | 2 | OTNOC - Turbine Hall-South Facade | 5.1 |
| Rank 18 | OTNOC - TH Turbine Exhaust Relief Valve | 18.4 | OTNOC - BH Desuperheater Steam Start-up | 14.9 | OTNOC - EDG Exhaust | 11.2 | OTNOC - BH Deaerator Outlet Vent Pipe | 12.6 | OTNOC - BH Feedwater Tank Relief | 8 | OTNOC - Turbine Hall-South Louvre 1 | 1.6 | OTNOC - Turbine Hall-South Louvre 1 | 3.3 |
| Rank 19 | OTNOC - BH Desuperheater Steam Start-up | 18.3 | OTNOC - BH Deaerator Outlet Vent Pipe | 14.9 | OTNOC - Turbine Hall-West Facade | 11 | OTNOC - TH Turbine Exhaust Relief Valve | 11.1 | OTNOC Steam Header 2-East Facade | 7.5 | OTNOC - Turbine Hall-West Facade | 1.3 | OTNOC - Turbine Hall-South Louvre 3 | 3.3 |
| Rank 20 | OTNOC - BH Deaerator Outlet Vent Pipe | 18.3 | OTNOC - TH Turbine Exhaust Relief Valve | 14.1 | OTNOC - BH Deaerator Outlet Vent Pipe | 10.6 | OTNOC - Turbine Hall-West Facade | 10.9 | OTNOC Steam Header 1-East Facade | 7.3 | OTNOC Steam Header 2 - Underneath | 0.9 | OTNOC - Turbine Hall-South Louvre 2 | 3.3 |
| Rank 21 | OTNOC - BH Superheater Steam Start-up | 16 | OTNOC - Turbine Hall-West Facade | 12.1 | OTNOC - BH Desuperheater Steam Start-up | 10.6 | OTNOC - BH Superheater Steam Start-up | 8.5 | OTNOC - Turbine Hall-South Louvre 1 | 6.7 | OTNOC Steam Header 1-East Facade | 0.8 | OTNOC - Turbine Hall-West Facade | 2.8 |
| Rank 22 | OTNOC - BH Feedwater Tank Relief | 16 | OTNOC - BH Superheater Steam Start-up | 11.6 | OTNOC Steam Header 2-West Facade | 5.6 | OTNOC - BH Feedwater Tank Relief | 8.5 | OTNOC - Turbine Hall-West Facade | 1 | OTNOC - Turbine Hall-South Louvre 2 | 0.5 | OTNOC - Turbine Hall-Roof Facade | 1.9 |
| Rank 23 | OTNOC - BH Relief Vent | 15.9 | OTNOC - BH Feedwater Tank Relief | 11.6 | OTNOC Steam Header 1-West Facade | 5.1 | OTNOC - BH Relief Vent | 8.5 | OTNOC - TH Gland Steam Bypass Vent | 0 | OTNOC - Turbine Hall-South Louvre 3 | 0.4 | OTNOC - EDG Exhaust | 0 |
| Rank 24 | OTNOC - BH Start up vent | 15.9 | OTNOC - BH Relief Vent | 11.6 | OTNOC - BH Feedwater Tank Relief | 3.2 | OTNOC - BH Start up vent | 8.5 | OTNOC - TH Steam Turbine Warm up Line | 0 | OTNOC - EDG Exhaust | 0 | OTNOC Steam Header 2-East Facade | 0 |

| Hierarchy of Dominant OTNOC Noise Sources | Noise Sensitive Receptor – GF | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | R1 - Hobby Drive | | R2 - Corby Business Academy | | R3 - London Road | | R4 - Larratt Road, Weldon | | R5 - Pen Green Lane | | R6 - Dunlop Close Travellers Site | | R7 - Brookfield Travellers Site | |
| | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) | Source | Noise Level / dB(A) |
| Rank 25 | OTNOC - Turbine Hall-South Door | 15.5 | OTNOC - BH Start up vent | 11.6 | OTNOC - BH Relief Vent | 3.2 | OTNOC - EDG Exhaust | 8.1 | OTNOC - TH Hogging Ejector Vent | 0 | OTNOC Steam Header 2-East Facade | 0 | OTNOC Steam Header 1-East Facade | 0 |
| Rank 26 | OTNOC - Turbine Hall-West Facade | 13.2 | OTNOC Steam Header 2-West Facade | 11.5 | OTNOC - BH Start up vent | 3.2 | OTNOC - Turbine Hall-South Door | 7.9 | OTNOC - EDG Exhaust | 0 | OTNOC - TH Hogging Ejector Vent | 0 | OTNOC - TH Hogging Ejector Vent | 0 |
| Rank 27 | OTNOC Steam Header 1-West Facade | 12.4 | OTNOC - Turbine Hall-South Door | 10.6 | OTNOC - BH Superheater Steam Start-up | 3 | OTNOC Steam Header 2-West Facade | 2.8 | OTNOC Steam Header 2 - Underneath | 0 | OTNOC - TH Steam Turbine Warm up Line | 0 | OTNOC - TH Steam Turbine Warm up Line | 0 |
| Rank 28 | OTNOC Steam Header 2-West Facade | 12.1 | OTNOC Steam Header 1-West Facade | 9.5 | OTNOC - Turbine Hall-South Door | 1.2 | OTNOC Steam Header 1-West Facade | 2.8 | OTNOC Steam Header 1 - Underneath | 0 | OTNOC - TH Gland Steam Bypass Vent | 0 | OTNOC - TH Gland Steam Bypass Vent | 0 |
| Rank 29 | OTNOC Steam Header 1 - Underneath | 4.4 | OTNOC Steam Header 1 - Underneath | 1.1 | OTNOC Steam Header 2 - Underneath | 0 | OTNOC Steam Header 2 - Underneath | 0 | OTNOC - Turbine Hall-South Door | 0 | OTNOC - TH Turbine Exhaust Relief Valve | 0 | OTNOC - TH Turbine Exhaust Relief Valve | 0 |
| Rank 30 | OTNOC Steam Header 2 - Underneath | 1.2 | OTNOC Steam Header 2 - Underneath | 0 | OTNOC Steam Header 1 - Underneath | 0 | OTNOC Steam Header 1 - Underneath | 0 | OTNOC - TH Turbine Exhaust Relief Valve | 0 | OTNOC - Turbine Hall-South Door | 0 | OTNOC - Turbine Hall-South Door | 0 |

T24 Hierarchy of noise sources – OTNOC

# 7 Best Available Techniques

Table 25 presents a review of the noise mitigation measures included in the operation of the new sources and compares them to the Best Available Technique (BAT) for that type of source. This approach takes into account the computer noise modelling and looks at all the new noise sources proposed for installation at the site. BAT has been considered in line with 'Noise and Vibration Management: Environmental Permits' (which supersedes the Horizontal Guidance Note H3).

| Source | Relative contribution of source to ambient (at the receptors) | Description of any screening | Description of Noise Control Measures | BAT Compliant | Potential BAT measures (in addition or in isolation) | *Possible operational benefits at receptor | **Recommended for improvement programme? |
|---|---|---|---|---|---|---|---|
| Tipping Hall and Roller Door | Negligible – source level more than 10 dB below ambient | No specific screening is provided | The building enclosure provides noise control for internal plant items, however the facade has weak points i.e. roller shutter doors. | No | Roller doors to be closed whenever possible during operational hours. Use of acoustic curtains when roller door open | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| Turbine Exhaust Duct | Negligible – source level more than 10 dB below ambient | No specific screening is provided | Purchase of low noise emitting machinery | No | Inclusion of attenuators in the atmospheric air connections to the system. Subject to airflow calculations. | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| FGT Hall | Negligible – source level more than 10 dB below ambient | No specific screening is provided | The building enclosure provides noise control for internal plant items, however the facade has weak points i.e. doors and louvres. | No | Doors to be closed whenever possible. Use of acoustic doors and uprated performance of the louvres | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| FGT Silos | Negligible – source level more than 10 dB below ambient | No specific screening is provided | The silos are enclosed on three sides however the top of the silos are open and considered the weak point in terms of noise attenuation | No | Inclusion of enclosure to the top of the silos subject to airflow calculations (or appropriate ventilation). | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| Boiler House | Negligible – source level more than 10 dB below ambient | No specific screening is provided | The building enclosure provides noise control for internal plant items, however the facade has weak points i.e. doors and louvres. | No | Doors to be closed whenever possible. Use of acoustic doors and uprated performance of the louvres | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| Bunker Hall | Negligible – source level more than 10 dB below ambient | No specific screening is provided | The building enclosure provides noise control for internal plant items | No | Increased building cladding performance | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| Stack Emission Point, ACC, Fin Fan Coolers and Condensers | Negligible – source level more than 10 dB below ambient | No specific screening is provided | Purchase of low noise emitting machinery | No | Inclusion of attenuators in the atmospheric air connections to the system. Subject to airflow calculations. Silencers in the steam discharge vents. | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| Generator and Transformer | Negligible – source level more than 10 dB below ambient | No specific screening is provided | Purchase of low noise emitting machinery | No | Inclusion of enclosure subject to airflow calculations (or appropriate ventilation). | < 1 dB(A) from plant item contribution | No – limited reduction to already negligible source noise contribution |
| Vehicle movements | Negligible – source level more than 10 dB below ambient | No specific screening is provided | Speed restrictions and considerate driving | No | N/A | N/A | N/A |

** Based on contribution of plant in comparison with ambient noise (i.e. where a contribution of plant noise is 10 dB (A) below ambient, plant mitigation would have a reduced impact on overall plant emissions).*
***Based on the BAT measures potential to reduce existing site noise contributions at receptors. Potential noise reduction less than 3 dB (A) considered to be imperceptible and therefore the cost associated with improvements would outweigh overall benefit.*

## T25 BAT Recommendations

The above table indicates that although there are possible improvements in accordance with BAT, the overall reduction in noise level (against the existing ambient noise) with the implementation of additional measures would be negligible at receptors, and therefore not considered reasonable or feasible.

# 8 Conclusion

RSK Acoustics (RSKA) has been instructed by Encyclis Limited to undertake a noise impact assessment in support of their environmental permit application in relation to the previously approved Energy from Waste (EFW) facility, located on Shelton Road, Corby, Northamptonshire.

Baseline noise measurements were undertaken at six locations, encompassing both long-term and short-term periods, covering the closest noise sensitive receptors to the facility.

A noise assessment has been undertaken which compares the predicted rated noise levels of proposed fixed plant and HGV movements against the derived background noise level at the considered noise sensitive receptors.

A rating correction of +3 dB has been applied to the specific sound level for 'other' readily distinguishable industrial noise, where the predicted levels are less than 10 dB below background. This correction has been applied in line with both British Standards 'BS 4142:2014+A1:2019' and Environment Agency Guidance 'Noise and Vibration Management: Environmental Permit' requirements.

When compared to the derived background noise levels, the rated predicted noise levels during normal conditions are consistent (i.e 0 dB) with the background (as a worse case) at the closest noise sensitive receptors. In accordance with BS 4142: 2014+A1: 2019, where the rating level does not exceed the background sound level, this is an indication of the development having a **low impact** on the existing (and nearest) sensitive receptors.

The predicted noise levels during OTNOC are likely to exceed the background sound levels by a maximum of 4 dB at one receptor during night-time periods. This is below the threshold of +5 dB which may be indicative of an adverse impact according to the standard. It should also be noted that the modelled OTNOC scenario is based on a worst case assessment, with normal conditions and all OTNOC sources operating concurrently.

Based on the computer noise modelling and influence of plant at the receptor locations, an assessment has been made of the Best Available Techniques (BAT) on site to determine where improvement measures can be implemented. The BAT assessment shows that no further noise control measures are considered appropriate for the proposed plant, with the design already embedding various mitigation measures (BAT).

End of Section

# Glossary of Acoustic Terms

*dB (decibel)*

Scale for expressing sound pressure level. It is defined as 20 times the logarithm of the ratio between the root mean square pressure of the sound field and a reference pressure i.e. 2 x 10-5 Pascal.

*dB (A)*

A-weighted decibel. This provides a measure of the overall level of sound across the audible spectrum with a frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies.

$L_{Aeq}$:

The notional steady sound level (in dB) which over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measurement over that period. Values are sometimes written using the alternative expression dB(A) $L_{eq}$.

$L_{Amax}$:

The maximum A-weighted sound pressure level recorded over the period stated. $L_{Amax}$ is sometimes used in assessing environmental noise when occasional loud noises occur, which may have little effect on the $L_{Aeq}$ noise level. Unless described otherwise, $L_{Amax}$ is measured using the "fast" sound level meter response.

$L_{A10}$ & $L_{A90}$:

If non-steady noise is to be described, it is necessary to know both its level and degree of fluctuation. The $L_{An}$ indices are used for this purpose. The term refers to the A-weighted level (in dB) exceeded for n% of the time specified. $L_{A10}$ is the level exceeded for 10% of the time and as such gives an indication of the upper limit of fluctuating noise. Similarly $L_{A90}$ gives an indication of the lower levels of fluctuating noise. It is often used to define the background noise.

$L_{A10}$ is commonly used to describe traffic noise. Values of dB $L_{An}$ are sometimes written using the alternative expression dB(A) $L_n$.

$L_{AX}$, $L_{AE}$ or SEL

The single event noise exposure level which, when maintained for 1 second, contains the same quantity of sound energy as the actual time varying level of one noise event. $L_{AX}$ values for contributing noise sources can be considered as individual building blocks in the construction of a calculated value of $L_{Aeq}$ for the total noise. The $L_{AX}$ term can sometimes be referred to as Exposure Level ($L_{AE}$) or Single Event Level (SEL).

*Free-field level*

A sound field determined at least 3.5m away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces.

*Specific noise level*

Specific noise level is the noise level emitted by the specific sound sources only.

*Rating noise level*

Rating level is the specific noise level plus any penalty added for distinguishable sound features of the noise.

# Appendix A: Facility Masterplan

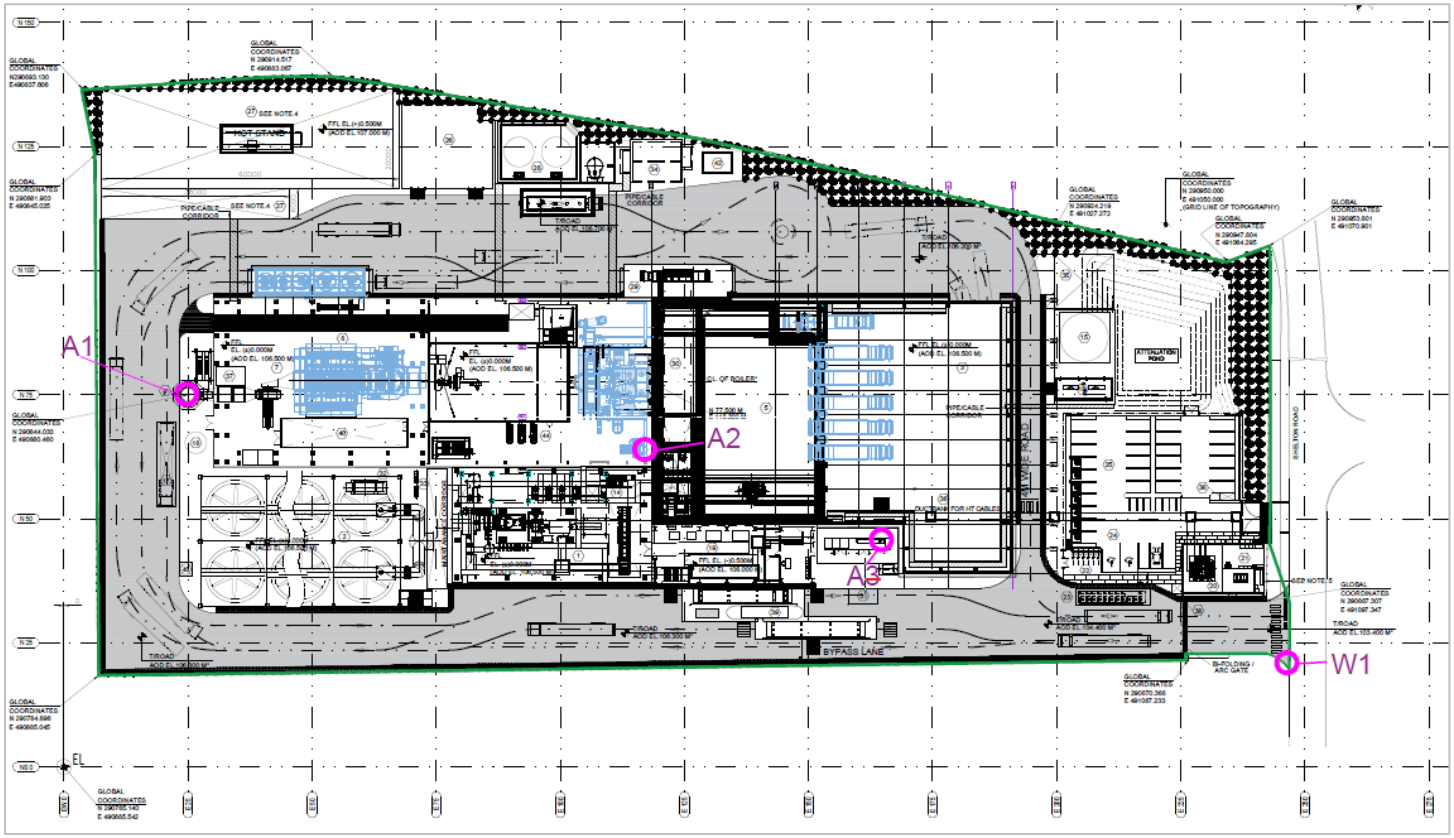



Figure AA.1: Facility plan – adopted from plan (ref: RPS drawing – Site layout JER9793)

# Appendix B: Noise Survey Results – Long Term Monitoring

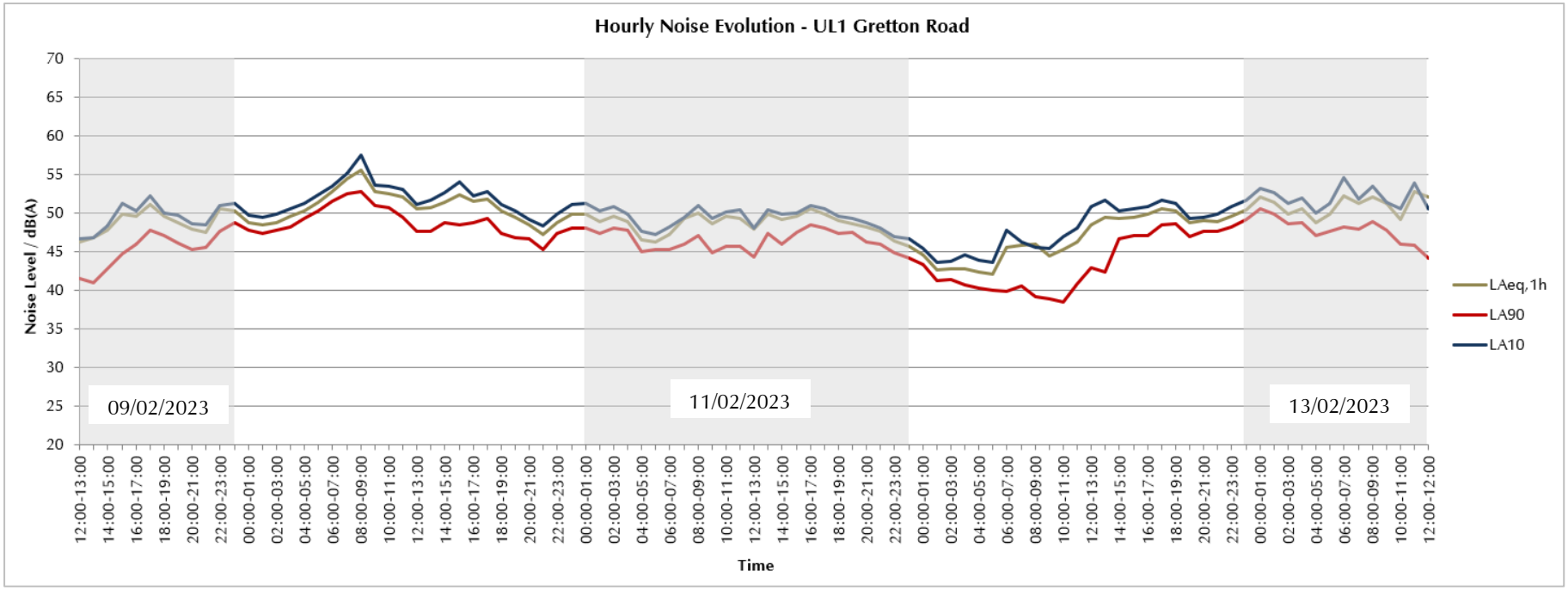



Table AB.1: UL1 Hourly noise evolution

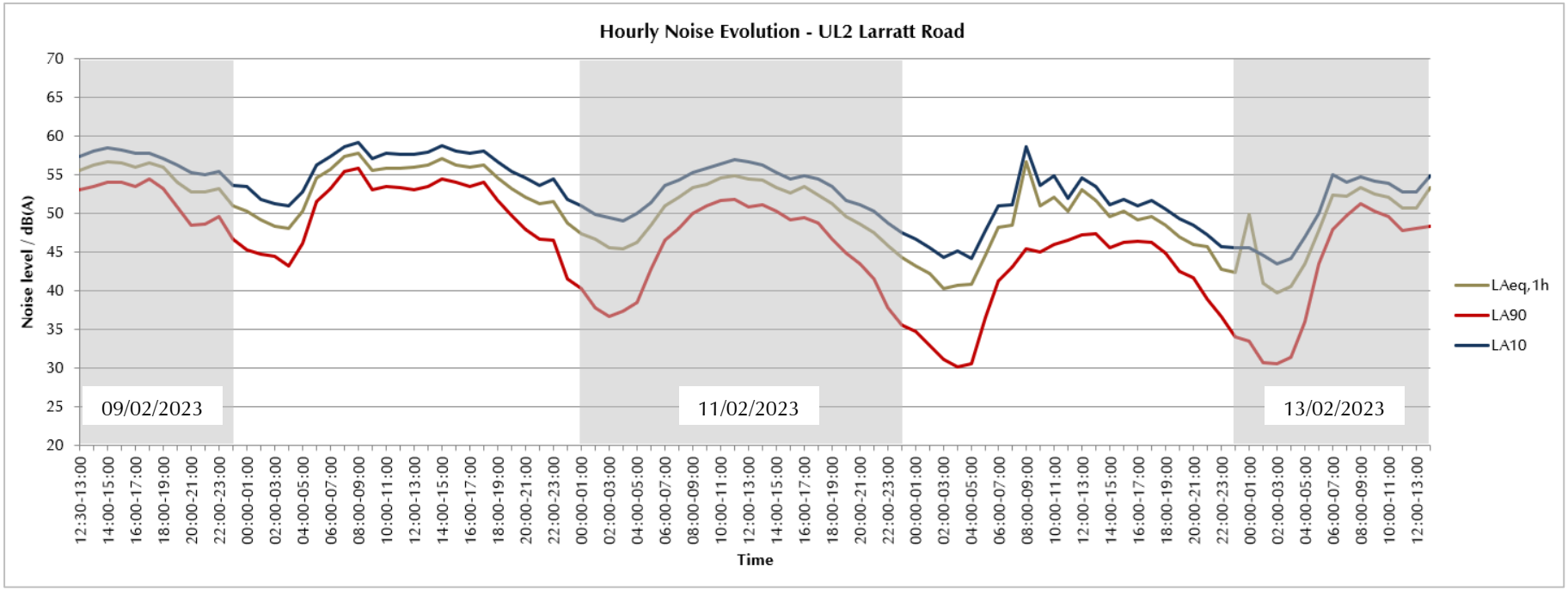



Table AB.2: UL2 Hourly noise evolution

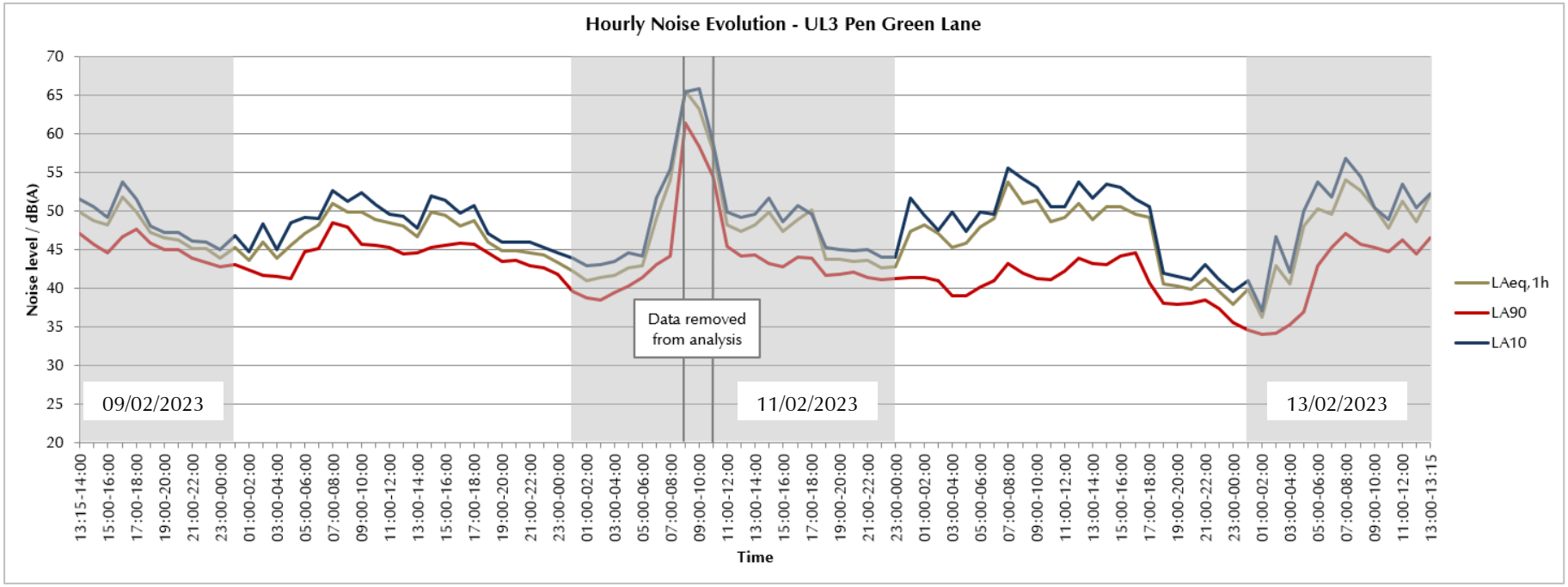



Table AB.3: UL3 Hourly noise evolution

# Appendix C: Background Noise Analysis – Long Term Monitoring

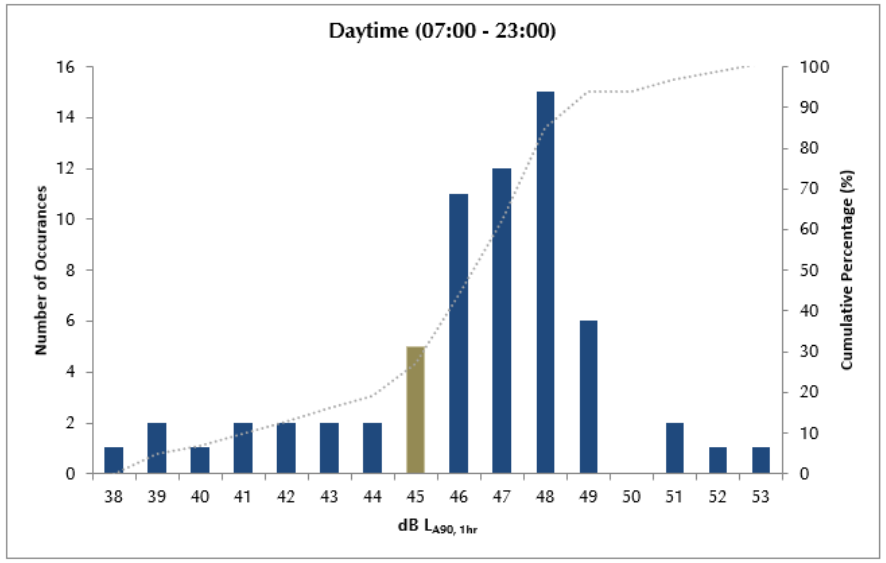



Table AC.1: UL1 Daytime Background Noise Analysis

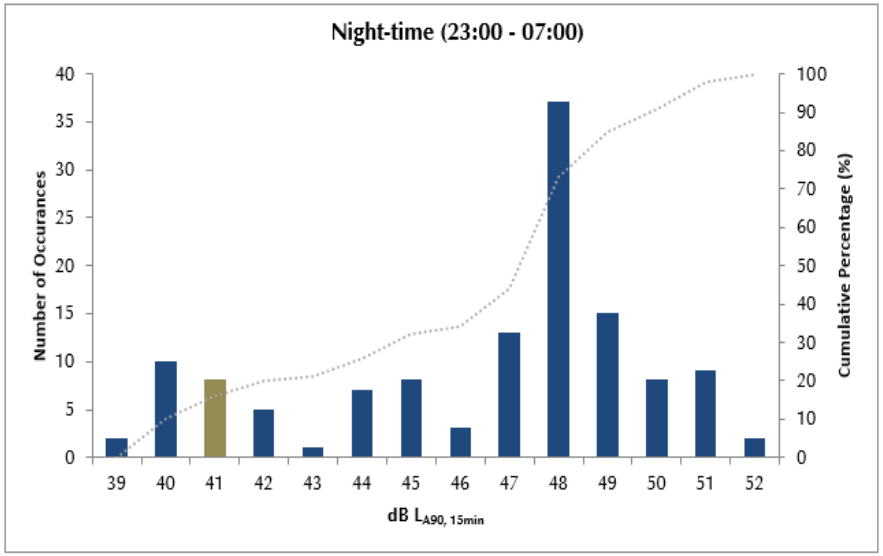



Table AC.2: UL1 Night-time Background Noise Analysis

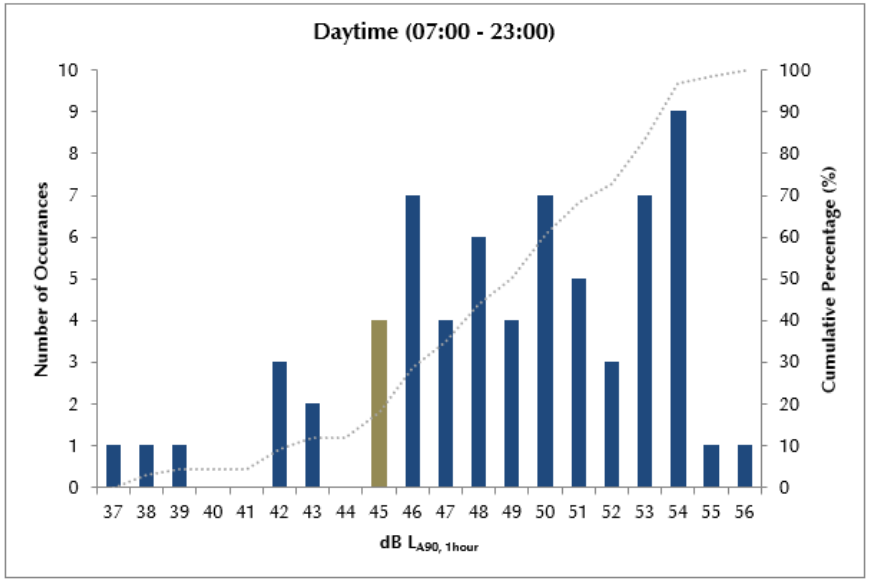



Table AC.3: UL2 Daytime Background Noise Analysis

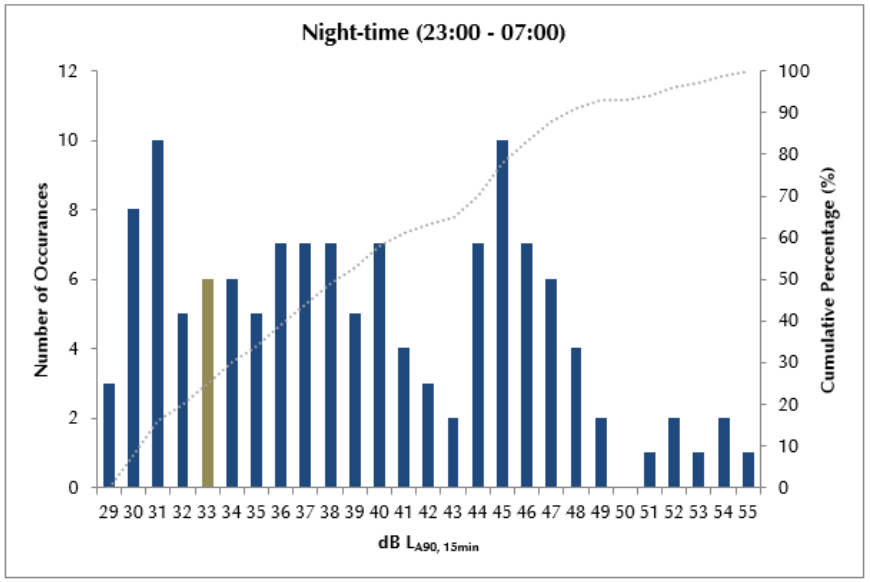



Table AC.4: UL2 Night-time Background Noise Analysis

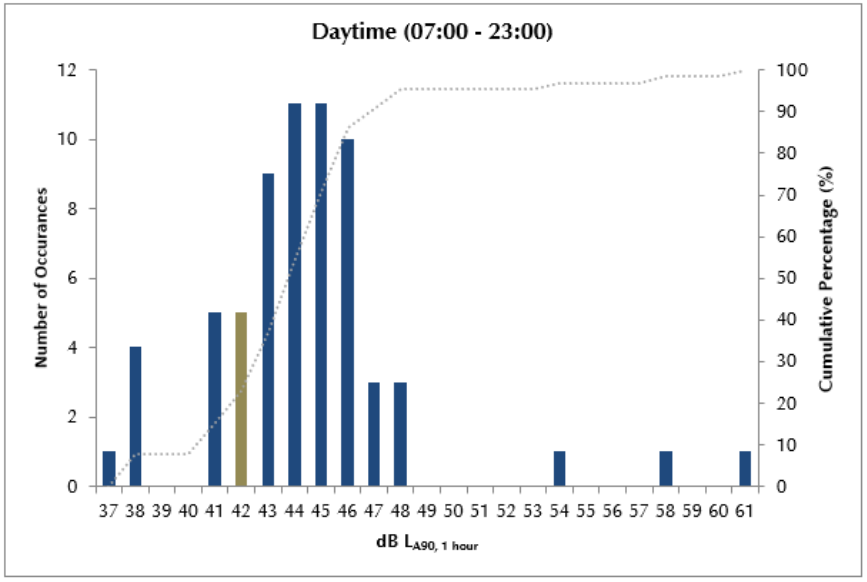



Table AC.5: UL3 Daytime Background Noise Analysis

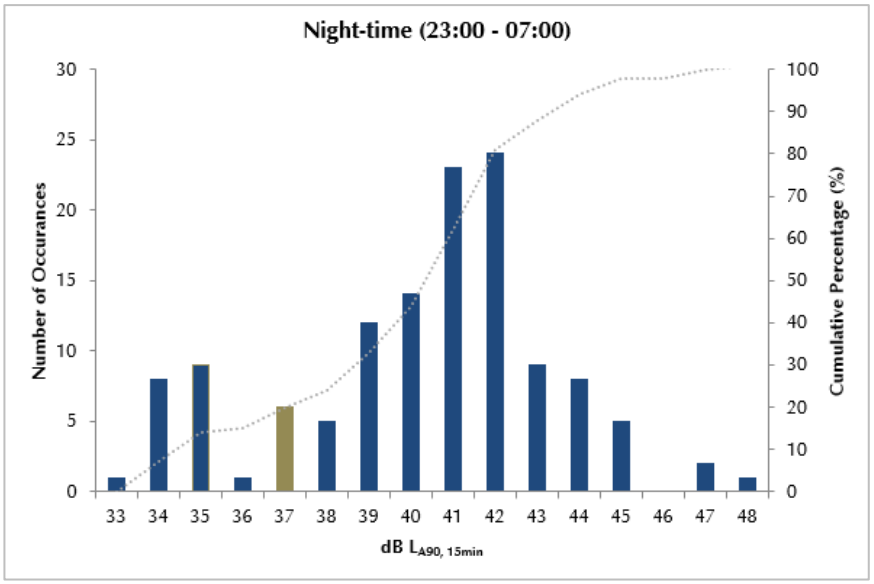
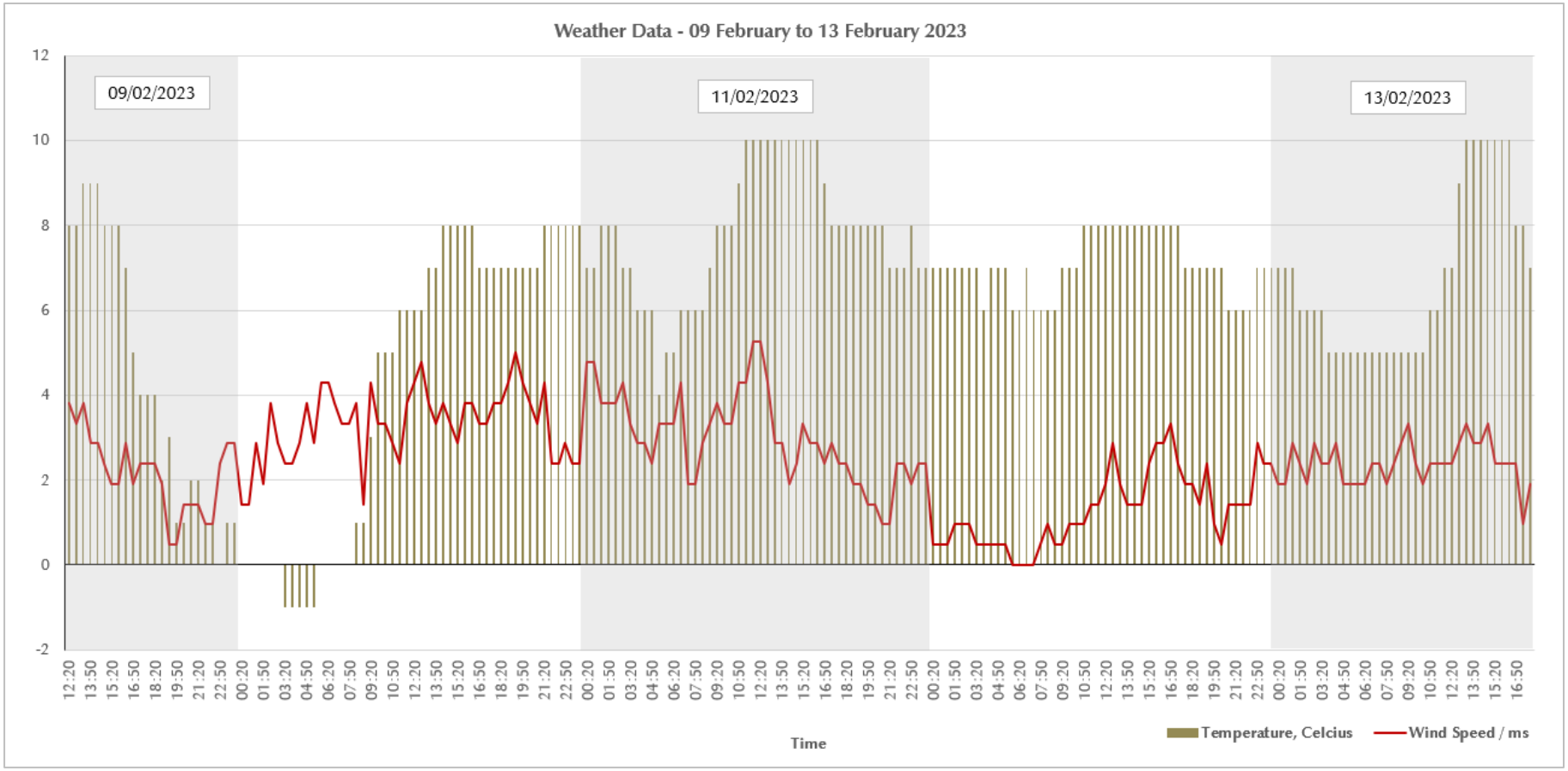



Table AC.6: UL3 Night-time Background Noise Analysis

# Appendix D: Weather Data



# Appendix E: Survey Photographs

Figure AD.1: UL1 Site photograph

Figure AD.2: UL1 Site photograph

Figure AD.3: UL2 Site photograph

Figure AD.4: UL2 Site photograph

Figure AD.5: UL3 Site photograph

Figure AD.6: UL3 Site photograph

Figure AD.7: AL1 Site photograph

Figure AD.8: AL2 Site photograph

Figure AD.9: AL3 Site photograph

**RSK Acoustics Limited** Reg. in England and Wales No. 7102436
rskacoustics.com info@rskacoustics.com +44 (0)1932 829007

Registered Office: Spring Lodge, 172 Chester Road, Helsby, WA6 0AR
Addlestone | Bristol | Coventry | Glasgow | Helsby | Hemel | Leeds | Manchester