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Appendix 3

Noise Assessment

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1.0 INTRODUCTION

1.1 Veolia Environmental Services Ltd currently operates a Materials Recovery Facility (MRF) at Watling Street, Hinckley. The site covers an area of approximately 2.2 hectares (5.43 acres) and currently operates metal recovery, storage and transfer of commercial and industrial non hazardous waste, including metals, and skip and container storage.

1.2 The site is located on the Leicestershire/Warwickshire border. An area of 0.6 hectares (1.48 acres) of the site lies within the Leicestershire County Council (Hinckley and Bosworth District) and 1.6 hectares (3.95 acres) lies within Warwickshire County Council (Rugby District).

1.3 This report will be submitted as part of a planning application by Veolia Environmental Services Ltd to improve the existing facility by repositioning operations within the site, and constructing buildings to house recovery facilities. In addition to the current activities, it is proposed to use the new building for the transfer, including recovery, of non hazardous household waste.

1.4 Vibrock Limited were engaged by Bowman Planton Limited to consider the effects of noise from such operations.

1.5 The study commenced with monitoring of existing noise levels at five residential locations around the site boundary. The monitoring was undertaken on Tuesday 22nd January 2008.

1.6 Noise levels during normal operations at five residential locations around the site boundary have been predicted using mobile plant specifications obtained from the existing plant at the current MRF site.

1.7 Noise levels from construction operations during the improvements of the existing facilities are also considered for the residential properties around the site boundary.

2.0 SITE DESCRIPTION

2.1 The Materials Recovery Facility (MRF) is located off Watling Street (A5) on the Leicestershire/Warwickshire border.

2.2 The site is opposite the A5 to the north and is adjacent to a railway line to the east.

2.3 The nearest residential property to the site is The Bungalow, which is adjacent to Padge Hall Farm, which is located to the south west of the site. A new residential housing development was constructed recently which is located to the north of the site, opposite the A5. The residential properties on this new development nearest the north of the site are located at Applebees Meadow. The nearest residential property to the east of the site is The Bungalow, which is located along Watling Street (A5).

3.0 NOISE TERMINOLOGY

3.1 Sound is produced by mechanical vibration of a surface, which sets up rapid pressure fluctuations in the surrounding air.

3.2 Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure level. It is because of this wide range that a noise level scale based on logarithms is used in noise measurement. This is the decibel or dB scale.

3.3 Audibility of sound covers a range of about 0 to 140 decibels (dB) corresponding to the intensity of the sound pressure level. The ability to recognise a particular sound is dependent on the pitch or frequencies present in the source. Sound pressure measurements taken with a microphone cannot differentiate in the same way as the ear, consequently a correction is applied by the noise measuring instrument in order to correspond more closely to the frequency response of the ear which responds to sounds from 20 Hz to 20000 Hz. This is known as 'A weighting' and written as dB(A).

3.4 The use of this unit is internationally accepted and correlates well with subjective annoyance to noise.

3.5 The logarithmic basis of noise measurements means that when considering more than one noise source their addition must be undertaken in terms of logarithmic arithmetic. Thus, two noise sources each of 40 dB(A) acting together would not give rise to 40 + 40 = 80 dB(A) but rather 40 + 40 = 43 dB(A). This 3 dB(A) increase represents a doubling in sound energy but would be only just perceptible to a human ear.

3.6 The following table gives typical noise levels in terms of dB(A) for common situations.

Approximate Noise Level dB(A)	***Example***
0	Threshold of hearing
30	Rural area at night, still air
40	Public library
50	Quiet office, no machinery
60	Normal conversation
70	Inside a saloon car
80	Vacuum cleaner
100	Pneumatic drill
120	Threshold of pain

3.7 Noise levels can vary with time according to source activity and indices have been developed in order to be able to assign a value to represent a period of noise level variations and to correspond with subjective response.

3.8 The L_{Aeq} or A weighted equivalent continuous noise level index is used to average the noise energy over a period of intermittent noise levels. It is the level of steady sound of equivalent energy and is usually referred to as the ambient noise level.

3.9 The L_{A90} index represents the noise level exceeded for 90% of the measurement period and is used to indicate the quieter sections of the measurement period. It is usually referred to as the background noise level.

3.10 The L_{Amax} index is the maximum root mean square A weighted noise level occurring during the measurement period.

4.0 NOISE CRITERIA

4.1 Minerals Policy Statement (MPS) 2: Controlling and Mitigating the Environmental Effects of Mineral Extraction in England

4.1.1 Minerals Policy Statement (MPS) 2 is the latest Government advice applicable to the control of noise from surface mineral workings in England and recommends the setting of absolute values for noise limits, linked to daytime, evening and night-time working periods, defined as 0700 – 1900 hours, 1900 – 2300 hours and 2300 – 0700 hours respectively.

4.1.2 Subject to a maximum of 55 dB $L_{Aeq,1h}$ (free field), Mineral Planning Authorities should aim to establish a noise limit at the noise sensitive property that does not exceed the background level by more than 10 dB(A).

4.1.3 It is recognised in MPS 2, however, that this will in many circumstances be difficult to achieve without imposing unreasonable burdens on the mineral operator. In such cases the limit should be as near that level as practicable during normal working hours (0700 – 1900) and should not exceed 55 dB(A) $L_{Aeq,1h}$ (free field).

4.1.4 Although MPS 2 is not considered to be directly relevant to this proposal, it is deemed to be relevant to the operation of mobile plant vehicles in the proposal.

4.2 IPPC H3 Horizontal Guidance for Noise Part 1

4.2.1 A document entitled "Horizontal Guidance for Noise Part 1 – Regulation and Permitting" IPPC H3 (part 1), was published by the Environment Agency as Version 2 in September 2002.

4.2.2 Under a heading of "Indicative BAT requirements" (page 9), paragraph 2 states:

"The Operator should also employ other noise control techniques to ensure that the noise from the installation does not give rise to reasonable cause for annoyance, in the view of the Regulator. In particular, the Operator should justify where Rating Levels (as defined in BS 4142:1997) from the installation exceed the numerical value of the Background Noise Level ($L_{A90,T}$) at the noise-sensitive receptors. Reasons why these levels may be exceeded in certain circumstances are given in Section 2.5.6 of this document."

4.2.3 Section 2.5.6 discusses numerical limits and states that:

.... it is suggested that the starting point for numerical levels should be a free-field rating level ($L_{Ar,Tr}$) of 50 dB by day and a façade rating level of 45 dB by night. .....

However, evidence suggests that the setting of absolute levels can lead to difficulties. Consequently the setting of levels linked to the background, with an overriding safeguard of absolute levels to ensure a baseline of good practice, is considered to be most appropriate. To be sure that there is no reasonable cause for annoyance, the Rating Level ($L_{Ar,Tr}$) of the noise from the installation should be the same as the Background Noise Level ($L_{A90,T}$), but there are several reasons why departures from this could be justified.

4.3 BS 5228: Part 1 1997 Noise and Vibration Control on Construction and Open Sites

4.3.1 Noise emission levels emanating from the site due to associated construction works for the proposed development will vary from day to day, but in order to give an indication of the probable noise levels generated by the works a worst case scenario has been considered. The procedures set out in British Standard, BS5228 : Part 1 1997 "Noise and Vibration Control on Construction and Open Sites" can be used to estimate construction noise levels at the nearest property.

4.3.2 BS5228 Part 1 does not specify a noise criteria for day time construction activities as there are a number of factors which could affect the acceptability of noise. These factors include the site location, existing background noise levels, duration of site work, hours worked, noise and vibration characteristics. It suggests that night time noise levels may need to be 10 dB(A) lower than daytime levels. Noise levels at the facades of occupied dwellings are suggested to be as low as 40 dB L_{Aeq} to prevent sleep disturbance.

4.3.3 An example of recent noise limits agreed for construction work is the Millennium Stadium Cardiff, which is detailed below:

Millennium Stadium Agreed Noise Limits for Construction Work

Days	*Hours*	*Time Period (hours)*	*Noise Limits /dB $L_{Aeq,T\ dB}$*
Monday-Friday	0700-0800	1	65
Monday-Friday	1800-1900	1	70
Monday-Saturday	0800-1800	10	75

4.3.4 Local Authorities have statutory powers to reduce or counteract the effects of noise from construction sites via the Control of Pollution Act 1974.

4.3.5 It has been assumed that there will be no construction work during the development of the proposed site between 1900 and 0700 hours.

4.3.6 Based on the above guidance levels and results of the background noise survey it would seem reasonable that the criteria for the assessment of the impact of construction noise to the sensitive receptors should be as detailed below:

Daytime Criteria for the Assessment of Noise Impacts from Construction Noise

Period	*Time Period (hours)*	*Noise Limit $L_{Aeq,\,T}$ / dB*
Daytime	0700 - 1900	65

5.0 NOISE LEVEL PREDICTIONS

5.1 Introduction

5.1.1 Noise has been defined as sound which is undesired by the recipient. The effect of noise on the neighbourhood are varied and complicated, including such things as interference with speech communication, disturbance of work, leisure or sleep. A further complicating factor is that in any one neighbourhood some individuals will be more sensitive to noise than others.

5.1.2 A measure that is in general use and is recommended internationally for the description of environmental noise is the equivalent continuous noise level or L_{Aeq} parameter.

5.1.3 In general, the level of noise in the local environs that arises from a development site will depend on a number of factors. The more significant of which are:-

(a) The sound power levels (L_{WA}) of the plant or equipment used on site.

(b) The periods of operation of the plant on site.

(c) The distance between the source noise and the receiving position.

(d) The presence or absence of screening effects due to barriers, or ground absorption.

(e) Any reflection effects due to the facades of buildings etc.

5.2 Prediction Methodology

5.2.1 The prediction method used in this study is based upon that outlined within British Standard (BS) 5228: 1997 "Noise and vibration control on construction and open sites".

5.2.2 BS 5228: 1997 incorporates recommendations made in Mineral Planning Guidance Note 11 (MPG 11) "The Control of Noise at Surface Mineral Workings" which was issued in 1993. MPG 11 proposed several modifications to the 1984 version of BS 5228, the most important ones being the option of calculated barrier shielding rather than estimated shielding, the inclusion of attenuation due to soft ground and angle of view corrections.

5.2.3 The maximum barrier attenuation of 10 dB(A) quoted within BS 5228 can be conservative and is recognised as such in section D.3.2.2.1 where it states "High topographical features and designed and positioned noise barriers could provide greater attenuation". Examples of the former are overburden mounds and excavation high walls whilst baffle banks and acoustic fences are examples of the latter.

5.2.4 In order to more accurately estimate the barrier attenuation for this study, the method used in the Calculation of Road Traffic Noise (CRTN) has been employed. This document describes a method for estimating barrier attenuation from thin rigid barriers. Thus, for the purposes of this exercise barrier attenuations have been based on methods within this document to a maximum of 11 dB(A).

5.3 Plant Complement

5.3.1 A list of plant sound power levels (L_{WA}) from which the noise predictions were made is presented in Tables 2 and 3. The plant complement during normal operations is based on information provided by Veolia Environmental Services Ltd. The sound power levels used during construction operations are either from manufacturer's data or from Vibrock's extensive in-house database of sound power levels measured over the years. All measured sound power levels take into consideration where applicable the operation of any reverse warning systems fitted to the plant.

5.4 Noise Prediction Assumptions

5.4.1 The noise prediction exercises are based on a number of assumptions concerning the working of the site. These assumptions are presented as follows:-

5.4.2 All predictions have been calculated at the closest approach of each of the three areas of the site (see Figure 2). The three areas involved in the predictions are the metal sorting and recovery area, empty skip/container area and the waste transfer building. They are therefore worst possible case scenarios which may be of relatively short duration. However, they indicate the maximum L_{Aeq} noise level to which a property may be exposed during the working of the site. By definition, the worst case situation may occur intermittently over the life of the site, thus longer term noise levels perceived outside of these areas would normally be significantly less.

5.4.3 The predictions have taken into account the construction stage of the current facility along with normal operations. For the construction stage of this proposal a number of items of mobile plant have been considered (see Table 2). Each of these items of mobile plant has been calculated to be operating at the closest point of the approximate location of the MRF (see Figure 1) to the five residential properties in the vicinity of the proposed site. These predictions are detailed in Table 4.

5.4.4 During normal operations, with reference to Table 5 and Figure 2, it has been assumed that a Liebherr loading shovel and Liebherr grab will be operating in the metal sorting and recovery area. The predictions have taken into account the proposed 3 metre high retaining wall around this area. In the waste transfer building, it has been predicted that a Liebherr grab will be operating in this area. In the empty skip/container store area the Daewoo D20S fork lift will be operating. The predictions have also taken into account the movement of HGVs in and out of the site, around the weighbridge area, waste transfer building and the metal sorting and recovery areas.

5.4.5 A traffic count was conducted by Veolia Environmental Services Ltd at Hinckley MRF on Monday 10th, Wednesday 12th and Friday 14th December 2008. These surveys were conducted between 0730 and 1645, and details the number of HGV movements around the site. The survey indicates that the total number of HGV's entering the site varied between 9 and 11 per hour for each of the survey dates (based on a 9 hour monitoring period). For the site predictions, the number of HGV movements has been based on the higher figure obtained during the traffic survey of 11 movements per hour. The site entrance is currently also utilised by an independent operation (Midco Limited). The traffic survey conducted by Veolia Environmental Services Ltd has also included HGV movements from this site, therefore the predicted HGV movements represent a worst case scenario for the site.

5.4.6 Given that all prediction methods are estimates and that in practice measured levels are invariably lower due to the effects of interactions between such things as meteorological conditions and air absorption, these predicted levels are a reasonable representation of the worst case predictions assuming ideal meteorological conditions for sound propagation.

6.0 SURVEY METHOD

6.1 Introduction

6.1.1 The methodology described below was employed during the noise survey.

6.2 Environmental Noise Measurement Technique

6.2.1 At all locations the microphone was placed 1.5 metres above the ground and where possible at least 3.5 metres from the nearest reflecting surface. The sound level meters were programmed to monitor over 15 minute periods and the following parameters were recorded:

L_{A10} in dB
L_{A90} in dB
L_{Amax} in dB
L_{Aeq} in dB

6.2.2 Five 2.0 hour noise surveys were undertaken to determine the existing noise levels in the vicinity of the site.

6.3 Noise Measurement Locations

6.3.1 The five monitoring locations are listed in the table below:

Location No.	*Description*
1	The Bungalow, Padge Hall Farm
2	34 Applebees Meadow
3	42 Applebees Meadow
4	66 Applebees Meadow
5	The Bungalow, Watling Street

6.3.2 Five residential locations were identified in the vicinity of the MRF facility. The closest residential properties identified around the boundary of the site are given in the table above.

6.3.3 The nearest residential property to the site was identified as The Bungalow, Padge Hall Farm, to the south west of the site. To the north of the site, adjacent to the A5, a number of new residential properties have been constructed, some of which are located adjacent to the A5 opposite the site. The properties are located at 34, 42 and 66 Applebees Meadow. To the east of the site, the nearest residential property is The Bungalow, located on Watling Street (A5).

7.0 SURVEY DETAILS

7.1 Instrumentation

7.1.1 The following instrumentation was used for all noise measurements:

Manufacturer	*Description*	*Type*	*Serial No.*
Cirrus	Integrating Sound Level Meters	CRL 702 CRL 702 CRL703B CRL 703B CRL 800	023382 023380 B17894F 021753 B12615FF
Cirrus	½" Pre polarised Condenser Microphone	CRL 224	-
Cirrus	Foam Windshield	-	-
Cirrus	Acoustic Calibrator	CRL 511D	015350

7.1.2 The following set-up parameters were used on the sound level meters during all noise measurements:

Time Weighting: fast
Frequency Weighting: A
Measurement Period: 15 minutes

7.2 Calibration

7.2.1 The sound level meters were calibrated with the electronic calibrator prior to commencement and on completion of the surveys. No significant drift in calibration was observed.

7.3 Survey Dates and Personnel

7.3.1 Noise levels were measured between the hours of 1030 and 1350 on Tuesday 22nd January 2008. The surveys were conducted by Mr A Green of Vibrock Limited.

7.4 Meteorological Conditions

7.4.1 Weather conditions were noted during the survey period.

7.4.2 The weather was dry and sunny with a maximum temperature of 6°C, and near calm conditions.

8.0 RESULTS

8.1 Noise levels measured at five locations around the boundary of the Materials Recovery Facility are shown in Table 1.

8.2 The sound power levels of mobile plant used in the noise predictions are presented in Tables 2 and 3.

8.3 In Table 4 the predicted noise levels during construction operations are compared with agreed noise limits during the construction of the Millennium Stadium.

8.4 In Table 5 for normal operations the predicted noise levels are compared with the noise criteria in MPS 2 and IPPC H3 guidance.

9.0 DISCUSSION

9.1 Introduction

9.1.1 Noise levels measured around the proposed Materials Recovery Facility are detailed in Tables 1.1 to 1.5. A summary is given in Sections 9.2 to 9.6 below.

9.1.2 Worst case noise level predictions from the construction and normal operation of a Materials Recovery Facility at five residential properties identified during the survey, are given in Table 3, together with an indication as to the difference between the predicted and measured noise levels against the agreed construction noise limits which were in place during the construction of the Millennium Stadium. For normal site operations the predicted noise levels are compared with the criteria recommended in MPS 2 and IPPC H3 guidance.

9.2 The Bungalow, Padge Hall Farm

9.2.1 The Bungalow is adjacent to Padge Hall Farm and is located approximately 180 metres south west of the site boundary.

9.2.2 Referring to Table 1.1, the ambient noise level ranged from 44.5 to 56.0 $L_{Aeq,15min,}$ with a resultant of 52 dB $L_{Aeq,2h}$ over the measurement period. The corresponding background noise level ranged from 40.8 to 44.9 $L_{A90,15min,}$ with a resultant of 42 dB L_{A90} averaged over the measurement period.

9.2.3 The noise climate at this location was dominated by road traffic noise on the A5. Reversing alarms were audible from the site during lulls in the traffic.

9.2.4 During construction operations, the calculated worst case noise level is 54 $L_{Aeq,1h,}$ which is above the existing measured L_{Aeq} measured at this location. The predicted noise level is below the 65 dB $L_{Aeq,1h}$ criterion of the agreed noise limit during construction operations.

9.2.5 During normal operations, the calculated worst case noise level is 45 $L_{Aeq,1h,}$ which is below the existing measured L_{Aeq} at this location. The predicted noise level is below the MPS 2 and IPPC H3 guidance criteria.

9.3 34 Applebees Meadow

9.3.1 34 Applebees Meadow is located adjacent to the A5, approximately 100 metres north of the site boundary.

9.3.2 Referring to Table 1.2, the ambient noise level ranged from 52.4 to 55.3 $L_{Aeq,15min,}$ with a resultant of 54 dB $L_{Aeq,2h}$ over the measurement period. The corresponding background noise level ranged from 45.4 to 48.9 $L_{A90,15min,}$ with a resultant of 47 dB L_{A90} averaged over the measurement period.

9.3.3 The noise climate at this location was dominated by road traffic noise on the A5. The site was inaudible at this location.

9.3.4 During construction operations, the calculated worst case noise level is 58 $L_{Aeq,1h}$, which is above the existing measured L_{Aeq} measured at this location. The predicted noise level is below the 65 dB $L_{Aeq,1h}$ criterion of the agreed noise limit during construction operations.

9.3.5 During normal operations, the calculated worst case noise level is 42 $L_{Aeq,1h}$, which is below the existing measured L_{Aeq} at this location. The predicted noise level is below the MPS 2 and IPPC H3 guidance criteria.

9.4 42 Applebees Meadow

9.4.1 42 Applebees Meadow is located adjacent to the A5, approximately 120 metres north of the site boundary.

9.4.2 Referring to Table 1.3, the ambient noise level ranged from 51.0 to 53.5 $L_{Aeq,15min}$, with a resultant of 52 dB $L_{Aeq,2h}$ over the measurement period. The corresponding background noise level ranged from 44.3 to 46.5 $L_{A90,15min}$, with a resultant of 46 dB L_{A90} averaged over the measurement period.

9.4.3 The noise climate at this location was dominated by road traffic noise on the A5. Site activities were inaudible at this location.

9.4.4 During construction operations, the calculated worst case noise level is 56 $L_{Aeq,1h}$, which is above the existing measured L_{Aeq} measured at this location. The predicted noise level is below the 65 dB $L_{Aeq,1h}$ criterion of the agreed noise limit during construction operations.

9.4.5 During normal operations, the calculated worst case noise level is 41 $L_{Aeq,1h}$, which is below the existing measured L_{Aeq} at this location. The predicted noise level is below the MPS 2 and IPPC H3 guidance criteria.

9.5 66 Applebees Meadow

9.5.1 66 Applebees Meadow is located adjacent to the A5, approximately 200 metres north of the site boundary.

9.5.2 Referring to Table 1.4, the ambient noise level ranged from 51.6 to 52.4 $L_{Aeq,15min}$, with a resultant of 52 dB $L_{Aeq,2h}$ over the measurement period. The corresponding background noise level ranged from 48.3 to 48.9 $L_{A90,15min}$, with a resultant of 49 dB L_{A90} averaged over the measurement period.

9.5.3 The noise climate at this location was dominated by road traffic noise on the A5. The site was inaudible at this location.

9.5.4 During construction operations, the calculated worst case noise level is 51 $L_{Aeq,1h}$, which is above the below measured L_{Aeq} measured at this location. The predicted noise level is below the 65 dB $L_{Aeq,1h}$ criterion of the agreed noise limit during construction operations.

9.5.5 During normal operations, the calculated worst case noise level is 39 $L_{Aeq,1h,}$ which is below the existing measured L_{Aeq} at this location. The predicted noise level is below the MPS 2 and IPPC H3 guidance criteria.

9.6 The Bungalow Watling Street

9.6.1 The Bungalow, Watling Street is located adjacent to the A5, approximately 140 metres north east of the site boundary.

9.6.2 Referring to Table 1.5, the ambient noise level ranged from 66.8 to 69.0 $L_{Aeq,15min,}$ with a resultant of 68 dB $L_{Aeq,2h}$ over the measurement period. The corresponding background noise level ranged from 55.8 to 59.9 $L_{A90,15min,}$ with a resultant of 58 dB L_{A90} averaged over the measurement period.

9.6.3 The noise climate at this location was dominated by road traffic noise on the A5. Site activities were inaudible at this location.

9.6.4 During construction operations, the calculated worst case noise level is 55 $L_{Aeq,1h,}$ which is below the existing measured L_{Aeq} measured at this location. The predicted noise level is below the 65 dB $L_{Aeq,1h}$ criterion of the agreed noise limit during construction operations.

9.6.5 During normal operations, the calculated worst case noise level is 37 $L_{Aeq,1h,}$ which is below the existing measured L_{Aeq} at this location. The predicted noise level is below the MPS 2 and IPPC H3 guidance criteria.

9.7 Site Traffic

9.7.1 It is generally accepted that noise level changes of 3 dB(A) are the minimum perceptible under normal conditions. Hence large variations in traffic flow numbers are needed before any noticeable change in traffic noise levels occur.

9.7.2 For example, a total traffic flow increase of 50% leads to a traffic noise increase of 1.8 dB, barely noticeable to the human ear, and less than the 3 dB(A) considered as a significant change by DETR in reference to traffic noise assessments.

10.0 CONCLUSIONS

10.1 A visual survey of the proposed Materials Recovery Facility has been made and noise levels measured at five locations around the existing facility. Measurements were made in terms of L_{Aeq}, L_{A10}, L_{A90} and L_{Amax}, thus enabling the existing noise climate to be characterised.

10.2 A series of noise predictions, based upon BS 5228 and CRTN, and including the assumptions embodied in Section 5 of this document, have been made to five residential properties identified around the Materials Recovery Facility. These predicted levels have been assessed against the noise criteria in MPS 2 and IPPC H3 guidance for normal site operations. Predicted levels for construction operations have been assessed against the agreed noise limit during construction activities.

10.3 The predictions refer to worst case scenarios, when operations are undertaken at the closest distances to noise sensitive properties and therefore have the greatest influence on the noise levels at each location.

10.4 From the results discussed in earlier sections it is apparent that calculated worst case noise levels from the construction and normal operation of the MRF:

(a) all five locations during normal operations do not exceed the L_{A90} + 10 dB(A) or 55 dB $L_{Aeq,1h}$ criterion, considered, when necessary as an upper limit in MPS 2.

(b) all five locations during normal operations do not exceed the 50 $L_{Aeq,1h}$ criterion in the IPPC H3 guidance.

(c) all five locations during construction operations do not exceed the 65 dB $L_{Aeq,1h}$ (free field) proposed noise limit during construction operations at the MRF.

10.5 With exercise of reasonable engineering control over general site operations, the Waste Recovery Facility at Watling Street, Hinckley should be able to operate within the criteria of MPS 2 and IPPC H3 guidance during normal operations and within the proposed noise limits during the construction operations.

11.0 REFERENCES

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1.3 Location No. 3 - 42 Applebees Meadow
1.4 Location No 4 - 66 Applebees Meadow
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2 List of Plant and Sound Power Levels During Construction Operations

3 List of Plant and Sound Power Levels During Normal Operation of the Materials Recovery Facility

4 Worst Case Predicted Noise Levels During Construction Operations

5 Worst Case Predicted Noise Levels During Normal Operation of a Materials Recovery Facility

TABLE 1.1

NOISE LEVEL SURVEY
AROUND THE PROPOSED MATERIALS RECOVERY FACILITY

Location No. 1: The Bungalow Padge Hall Farm

Monitoring Period	***Statistical Parameters (dB)***			
	L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}
1030 – 1045	52.7	50.7	44.9	69.6
1045 – 1100	54.7	52.0	44.3	74.6
1110 – 1115	50.0	47.4	42.8	69.9
1115 – 1130	53.3	53.5	41.8	69.1
1130 – 1145	44.5	45.7	41.4	52.7
1145 – 1200	48.2	45.5	40.8	66.9
1200 – 1215	56.0	52.1	41.6	81.1
1215 – 1230	49.2	46.5	41.2	68.4
Over 2.0 hour period	***52***	***49***	***42***	***81***

TABLE 1.2

NOISE LEVEL SURVEY
AROUND THE PROPOSED MATERIALS RECOVERY FACILITY

Location No. 2: 34 Applebees Meadow

Monitoring Period	***Statistical Parameters (dB)***			
	L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}
1130 – 1145	52.7	54.7	47.1	63.7
1145 – 1200	52.4	54.9	45.4	62.4
1200 – 1215	52.4	54.6	47.0	63.4
1215 – 1230	53.7	55.8	46.7	72.4
1230 – 1245	52.4	54.3	46.3	62.0
1245 – 1300	55.3	56.6	47.9	77.8
1300 – 1315	53.8	55.8	48.0	68.0
1315 – 1330	54.4	56.4	48.9	72.5
Over 2.0 hour period	***54***	***55***	***47***	***78***

TABLE 1.3

NOISE LEVEL SURVEY
AROUND THE PROPOSED MATERIALS RECOVERY FACILITY

Location No. 3: 42 Applebees Meadow

Monitoring Period	***Statistical Parameters (dB)***			
	L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}
1130 – 1145	51.2	53.4	45.7	67.0
1145 – 1200	51.0	53.4	44.3	66.2
1200 – 1215	51.1	53.1	45.6	64.6
1215 – 1230	53.5	54.6	45.5	76.0
1230 – 1245	53.5	55.8	45.8	72.7
1245 – 1300	52.7	55.0	46.4	70.5
1300 – 1315	51.7	53.9	45.9	61.8
1315 – 1330	52.1	54.3	46.5	70.2
Over 2.0 hour period	***52***	***54***	***46***	***76***

TABLE 1.4

NOISE LEVEL SURVEY
AROUND THE PROPOSED MATERIALS RECOVERY FACILITY

Location No. 4: 66 Applebees Meadow

Monitoring Period	***Statistical Parameters (dB)***			
	L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}
1115 – 1130	52.0	53.0	48.6	67.0
1130 – 1145	52.2	53.3	48.9	66.3
1145 – 1200	51.6	52.8	48.4	64.1
1200 – 1215	52.1	53.4	48.6	66.2
1215 – 1230	51.6	52.9	48.4	62.7
1230 – 1245	52.3	52.8	48.3	68.7
1245 – 1300	52.4	53.6	48.8	67.3
1300 – 1315	52.1	53.3	48.8	64.4
Over 2.0 hour period	***52***	***53***	***49***	***69***

TABLE 1.5

NOISE LEVEL SURVEY
AROUND THE PROPOSED MATERIALS RECOVERY FACILITY

Location No. 5: The Bungalow, Watling Street

Monitoring Period	***Statistical Parameters (dB)***			
	L_{Aeq}	L_{A10}	L_{A90}	L_{Amax}
1150 – 1205	67.0	70.4	55.8	84.7
1205 – 1220	67.2	70.5	57.9	75.7
1220 – 1235	67.4	70.8	58.6	77.0
1235 – 1250	68.7	71.3	59.1	84.2
1250 – 1305	67.1	70.3	58.4	76.5
1305 – 1320	68.3	71.2	58.4	91.4
1320 – 1335	69.0	71.8	59.9	85.9
1335 – 1350	66.8	70.1	58.1	76.4
Over 2.0 hour period	***68***	***71***	***58***	***91***

TABLE 2

LIST OF PLANT AND SOUND POWER LEVELS DURING CONSTRUCTION OPERATIONS

Plant Description	*Quantity*	*Sound Power Level dB(A)*
Piling Rig	1	117
Tracked Crane	1	111
Concrete Mixer Lorry	5 per hour	110

TABLE 3

LIST OF PLANT AND SOUND POWER LEVELS DURING NORMAL OPERATION OF THE MATERIALS RECOVERY FACILITY

Plant Description	*Quantity*	*Sound Power Level dB(A)*
Liebherr Loading Shovel	1	104
Liebherr 914 Grab	2	103
Daewoo D20S Fork Lift	1	102
HGV`s	10 per hour	110

TABLE 4

WORST CASE PREDICTED NOISE LEVELS DURING CONSTRUCTION OPERATIONS

Monitoring Location	***Existing Noise Levels dB(A)***		***Predicted Worst Case $L_{Aeq,1h}$ dB(A)***	***Difference dB(A)***	
	L_{Aeq}	***L_{A90}***		***Existing L_{Aeq}***	***Construction Limit 65 $L_{Aeq,1h}$ dB(A)***
The Bungalow Padge Hall Farm	52	42	54	+2	-11
34 Applebees Meadow	54	47	58	+4	-7
42 Applebees Meadow	52	46	56	+4	-9
66 Applebees Meadow	52	49	51	-1	-14
The Bungalow Watling Street	68	58	55	-13	-10

TABLE 5

WORST CASE PREDICTED NOISE LEVELS DURING NORMAL OPERATION OF A MATERIALS RECOVERY FACILITY

Monitoring Location	Existing Noise Levels dB(A)		Predicted Worst Case $L_{Aeq,1h}$ dB(A)	Difference dB(A)			
	L_{Aeq}	L_{A90}		Existing L_{Aeq}	MPS 2 Maximum 55 L_{Aeq}	MPS 2 L_{A90} + 10	IPPC H3 Guidance 50 L_{Aeq}
The Bungalow Padge Hall Farm	52	42	45	-7	-10	-7	-5
34 Applebees Meadow	54	47	42	-12	-13	-15	-8
42 Applebees Meadow	52	46	41	-11	-14	-15	-9
66 Applebees Meadow	52	49	39	-13	-16	-20	-11
The Bungalow Watling Street	68	58	37	-31	-18	-31	-13

Figure 1

Noise Monitoring and Prediction Locations

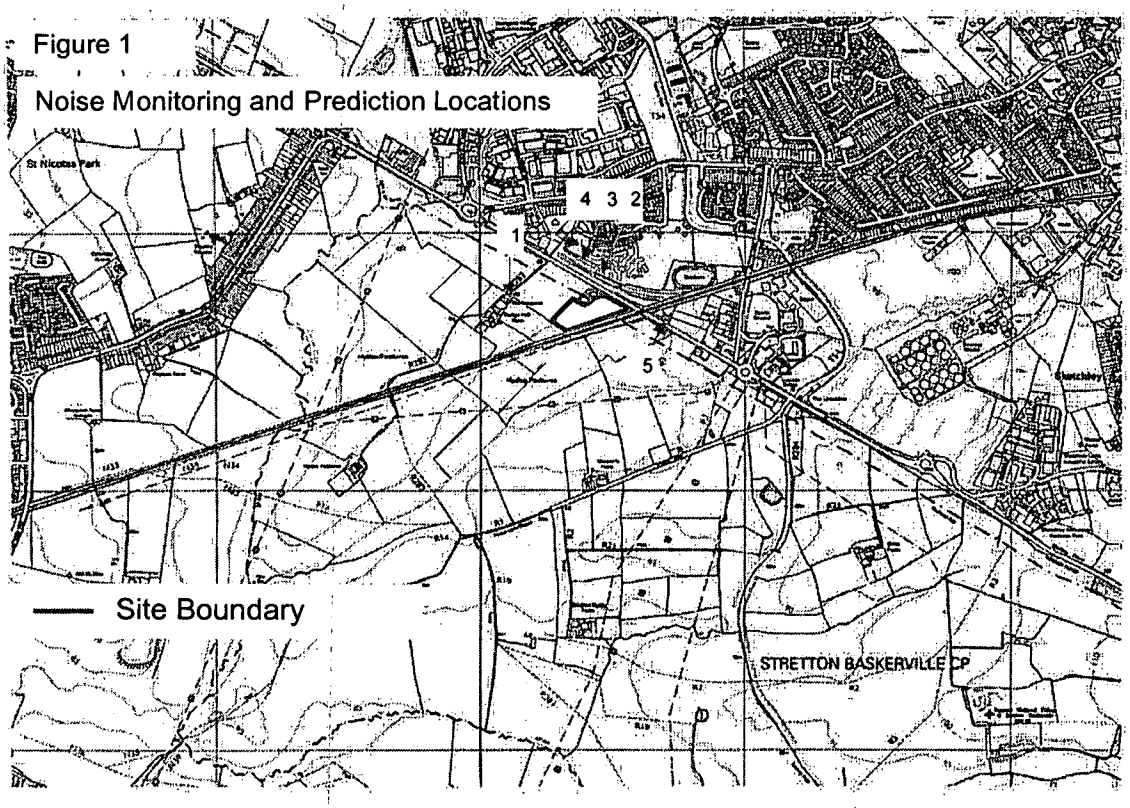

Figure 2

Proposed Site Layout

