Adams Food Ingredients
Leek

ENVIRONMENTAL NOISE SURVEY
& NOISE IMPACT ASSESSMENT
REPORT 16166/NIA1

For :

Adams Food Ingredients
Prince Street
Leek
Staffordshire
ST13 6DB

19 February 2010

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ENVIRONMENTAL NOISE SURVEY &
NOISE IMPACT ASSESSMENT REPORT
16166/NIA1

CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

This Report refers to the proposed development of the Adams Food Ingredients site on Sunnyhills Road, Leek. Noise associated with the development could potentially impact on nearby noise sensitive receptors without sufficient noise control measures in place.

Hann Tucker Associates have therefore been commissioned to undertake an environmental noise survey of the site and assess the prevailing noise impact using the results of the survey,

This report presents the methodology and results of the environmental noise survey, together with the findings of the noise impact assessment.

2.0 SCOPE OF ASSESSMENT

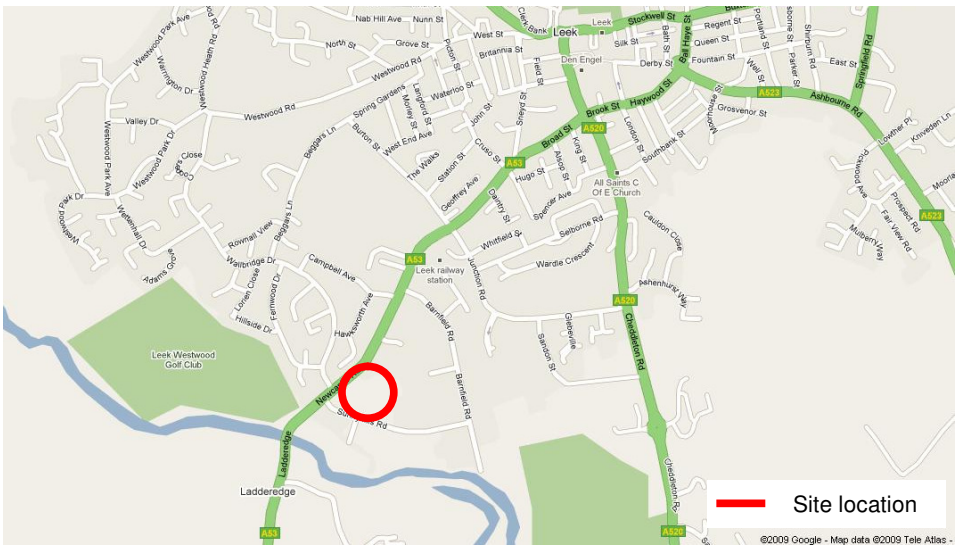
To establish, by means of detailed 7 day automated environmental noise monitoring, the existing A-weighted (dBA) L_{eq}, L_{90}, L_{10} and L_{max} environmental noise levels along with associated octave band spectra representative of the noise climate at the nearest noise sensitive receptors to the site.

To undertake an assessment of delivery vehicle noise emissions to the nearest noise sensitive premises. Advice will be given, together with appropriate performance specifications as required, for acoustic screens to meet the proposed noise criteria.

3.0 SITE DESCRIPTION

3.1 Location

The site is located off the A53 on the outskirts of Leek, Staffordshire, as indicated below, and falls within the jurisdiction of Staffordshire Moorlands District Council.

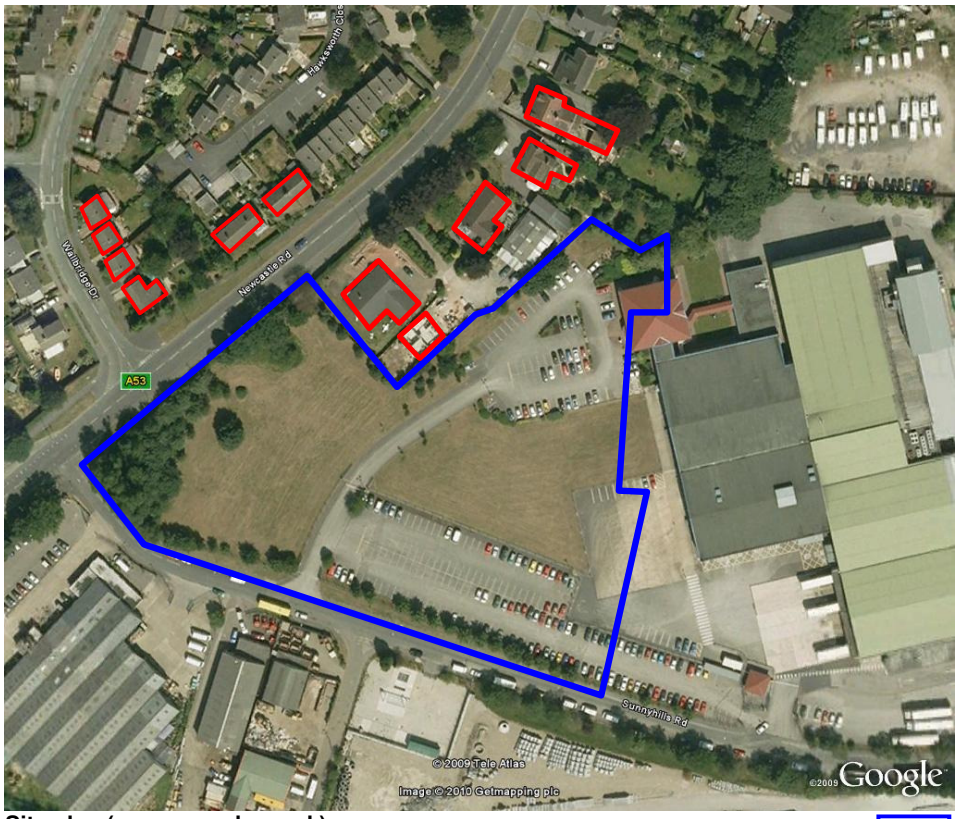


Location map (maps.google.co.uk)

3.2 Description

The site is located with Sunnyhills Road to the South and Newcastle Road to the West and consists of grassland. To the East of the site lies the Kerrygold factory and head office. Industrial premises lie opposite the site on Sunnyhills Road to the South.

The nearest noise sensitive properties are located to the North and West of the site in the form of two storey houses. A site plan is provided below. **Note: The existing car parks within the site boundary indicated on the plan below are no longer present on site.**



Site plan (maps.google.co.uk)

Adams Food Ingredients Site

Noise Sensitive Properties

4.0 ACOUSTIC TERMINOLOGY

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 ENVIRONMENTAL NOISE SURVEYS

5.1 Procedure

Fully automated environmental noise monitoring was undertaken from 16:30 hours on Tuesday 26 January 2010 to 16:30 hours on Tuesday 2 February 2010.

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately comment on the weather conditions throughout the entire duration of the survey. However, at the beginning of the survey period, wind conditions were calm and the sky was generally overcast although there was no rainfall. Road surfaces appeared mainly dry. At the end of the survey period, wind conditions were breezy, with light sleet. We understand however that throughout the week there was little precipitation and road surfaces were mainly dry. These conditions are considered suitable for obtaining representative measurement results.

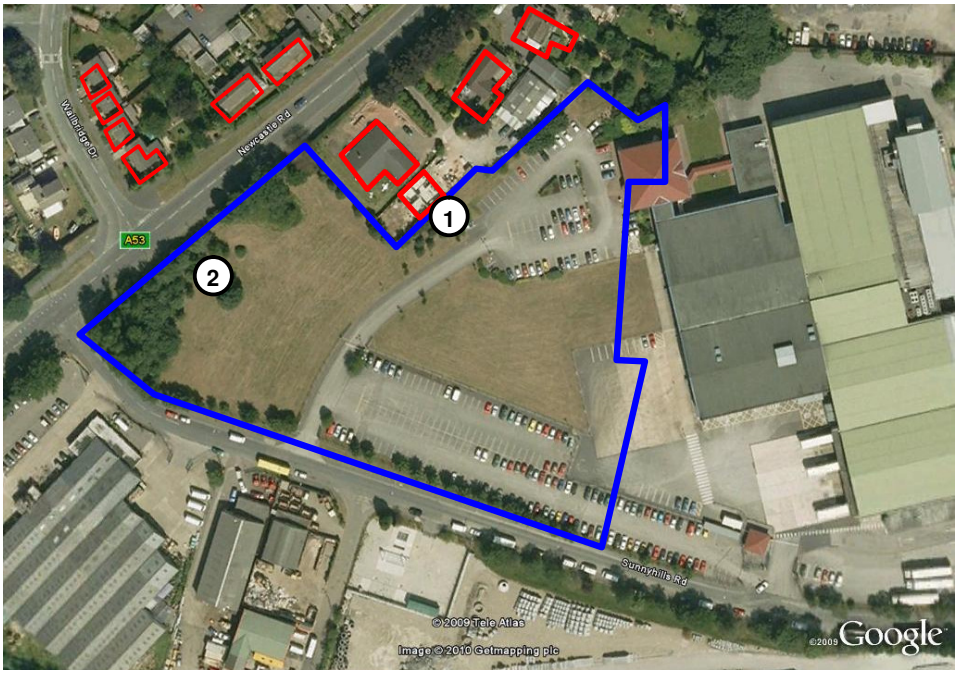
The automated equipment was set to record the A-weighted (dBA) L_{eq}, L_{90}, L_{10} and L_{max} sound pressure levels continuously over 15-minute intervals.

5.2 Measurement Positions

The noise level measurements were undertaken at 2No. positions around the development site. The measurement positions are described in the table below.

Position Number	Description
1	The microphone was located at a height of approximately 2m close to the northern site boundary with the residential properties on Newcastle Road. The microphone was located approximately 55m from Newcastle Road
2	The microphone was located at a height of approximately 2m and approximately 15m from Newcastle Road.

The positions were selected in order to assess the noise levels at the nearest noise sensitive façades and are shown on the plan below (maps.google.co.uk). The measurement positions were considered suitable for obtaining representative measurement results at surrounding residential properties.



Site plan showing approximate measurement position (maps.google.co.uk)

Adams Food Ingredients Site

Noise Sensitive Properties

5.3 Instrumentation

The instrumentation used during the survey is presented in the Table below:

Description	Manufacturer	Type	Serial Number	Latest Verification
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3701	18/03/2009
Type 1 Microphone	Larson Davis	4189	8523	18/03/2009
Type 1 Data Logging Sound Level Meter	Larson Davis	824	3780	17/09/2009
Type 1 Microphone	Larson Davis	4189	106753	17/09/2009
Type 1 Calibrator	Larson Davis	CAL200	3083	10/10/2009

Each sound level meter was located in an environmental case with the microphone connected to the sound level meter via an extension cable. The microphone was fitted with a Larson Davis windshield.

Each sound level meter, including the extension cable, was calibrated prior to and on completion of the surveys. No significant deviations occurred (no more than 0.1 dB).

5.4 Results

The results have been plotted on Time History Graphs 16166/TH1 to 16166/TH4 enclosed presenting the 15 minute A-weighted (dBA) L_{10}, L_{90}, L_{eq} and L_{max} levels at the measurement positions throughout the duration of the survey.

For the purpose of setting appropriate noise emission criteria, the following Table details the minimum ambient A-weighted (dBA) $L_{eq,15min}$ levels measured during daytime (07:00-23:00 hours) and night-time (23:00-07:00 hours) periods.

Measurement Position	Minimum Measured)Sound Level (dBA)	
	Daytime (07:00 – 23:00)	Night-time (23:00 – 07:00)
	$L_{eq,1hour}$	$L_{eq,15min}$
1	51	35
2	44	39

5.5 Discussion of Noise Climate

Due to the nature of the survey, i.e. unmanned, it is not possible to accurately describe the dominant noise sources, or specific noise events throughout the entire survey period. However at the beginning and end of the survey period the dominant noise source was noted to be vehicular movements on Newcastle Road.

It should be noted that as the site is located on an existing industrial park the residual background noise (i.e. the noise level when all intermittent sources (cars) of noise are absent) is likely to be dominated by noise associated with the operation of the nearby businesses.

6.0 NOISE IMPACT ASSESSMENT OVERVIEW

6.1 Service Yard Operation

The development is designated for continuous, 24 hour use. We understand that whilst 24 hour service yard use is being applied for this is unlikely to be needed with the majority of deliveries taking place between 07:00 and 23:00. Nevertheless we have assessed noise from service vehicles over both a daytime and night-time period in order to provide a worst case assessment.

We understand the number of service yard activities projected for 2012 are as follows:

- 25 weekly Arctic HGV collections (24 hour);
- 25 weekly Arctic HGV deliveries (24 hour);
- 12 weekly small van collections (daytime);
- 25 weekly small van deliveries (daytime);
- 32 weekly small van deliveries post/office supplies (daytime);
- 3 weekly small van laundry collections/deliveries (daytime);
- 3 weekly small van maintenance visits (daytime);
- 1 weekly skip collection (daytime);
- 1 weekly compactor collection (daytime).

We have assumed that night-time service yard activity is likely to be around 33% of the daytime activity. Based upon the information detailed above, we have based our assessment on the following worst case daytime (07:00-23:00) and night-time (23:00 – 07:00) periods.

Service Yard Activity		**Number of Occurrences**	
Type	**Vehicle**	**Daytime (07:00 – 23:00)**	**Night-time (23:00 – 07:00)**
Arctic HGV Deliveries	HGV Arrival	3	1
	HGV Departure	3	1
	HGV Loading (Forklift)	36	12
Arctic HGV Collections	HGV Arrival	2	1
	HGV Departure	2	1
	HGV Loading (Forklift)	24	12
Other Deliveries/Collections	Small Van Arrival	5	0
	Small Van Departure	5	0
	Fork Lift Movements	20	0
Laundry and Maintenance	Small Van Arrival	4	0
	Small Van Departure	4	0
Waste Collection	Skip/Compactor Arrival	1	0
	Skip/Compactor Departure	1	0

6.2 Noise data

The Single Event Level (SEL) noise data used in our calculations is presented in the Table below.

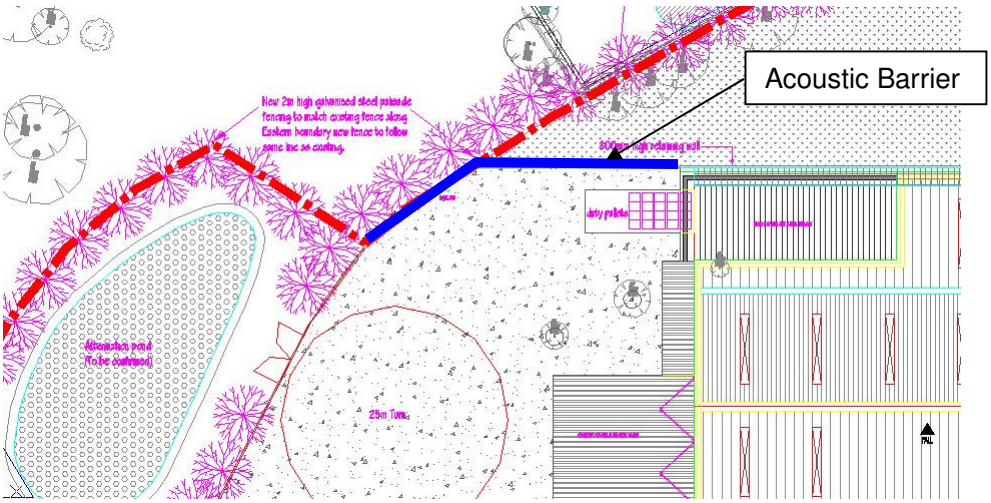
Activity Type	Typical A-Weighted Single Event Level (SEL)
Small Van Arrival	76.5 dB at 5m
Small Van Departure	77.3 dB at 5m
HGV (Arctic) Arrival	96.3 dB at 5m
HGV (Arctic) Departure	97.4 dB at 5m
HGV (Arctic) Idling	105.6dB at 5m
Fork Lift Truck Movement (Load/Unload)	80.8dB at 5m
Waste Collection	96.3dB at 5m

The source noise levels above are based on a survey data from both the existing Adams Food Ingredients factory in Leek and from previous noise measurements undertaken by ourselves.

The nearest noise sensitive properties are located to the North in the form of a bungalow and West of the site in the form of two storey houses.

6.3 Acoustic Barrier

We understand that provision has been made for a purpose built acoustic barrier to assist with the attenuation of noise levels from the service yard. Our assessment has been based upon the use of an imperforate acoustic barrier providing screening between the receptor and the service yard. The barrier should comply with the enclosed Acoustic Specification for Acoustic Screen (Timber) 16166/AS1 and be of a height sufficient to provide at least line of sight screening between the residential receptor and the service yard. The screen should abut the factory wall and extend around the service yard as indicated on the sketch below. Please find enclosed a list of suitable suppliers of acoustic fencing.



6.4 Human Response to 'Change in Noise Level'

The noise impact of vehicular movements can be compared with the following criteria, which relate the resultant change in noise level to the subject impression thereof and the human response thereto.

Change in Sound Level dB(A)	Interpretation	
	Subjective Impression	Human Response to change in noise level
< 2	Imperceptible change in loudness	Insignificant
3 to 5	Perceptible change in loudness	Noticeable
6 to 10	Up to a doubling or halving of loudness	Significant
11 to 15	More than a doubling or halving of loudness	Substantial
16 to 20	Up to a quadrupling or quartering of loudness	Substantial
21 or more	More than a quadrupling or quartering of loudness	Very Substantial

Unless stated, noise impacts are calculated outside the residential properties, although any subjective impacts ("Insignificant", "Noticeable", etc.) apply to both internal and external noise levels (it is assumed the difference between the two, due to the sound insulation performance of the external residential façade, is constant).

The noise impact of vehicular movements should be assessed using the time intervals of BS4142, i.e. 1-hour for daily activities, and 5-minutes for night-time activities.

7.0 DELIVERY NOISE ASSESSMENT

As BS4142 is only intended to assess fixed or steady industrial noise sources, we have assessed delivery noise by reviewing the subsequent change in noise levels at the nearest noise sensitive receptors which can be related directly to average human response using the table presented in Section 6.4.

During the daytime period we have assessed a worst case single HGV delivery/collection, 4 smaller deliveries and a waste collection visit. During the night-time period we have assessed a worst case single HGV delivery/collection. The predicted service yard noise levels have been assessed against the lowest 15 minute ambient noise levels recorded during the night-time period and against the lowest hourly ambient noise levels recorded during the daytime period. These levels can be found in Section 5.4. Our assessment calculations are provided in Appendix B enclosed.

The results of our assessment indicate an increase in noise levels of approximately 1.8dB during the daytime. With reference to Section 6.4 this corresponds to a imperceptible change in loudness and therefore a insignificant human response to the noise levels.

The results of our assessment indicate an increase in noise levels of approximately 21.5dB during the night-time. With reference to Section 6.4 this corresponds to a very substantial increase in the human response to the change in noise level.

8.0 SERVICE YARD ACOUSTIC GOOD PRACTICE

In order to keep noise levels as low as possible the following management and control measures should be employed in order to ensure that noise levels due to service yard operation are minimised:

- Vehicle reversing alarms should be set to the minimum required for safe and efficient operations;
- Restrict drop heights during lorry loading to the minimum required for safe and efficient operations;
- Playing of radios and undue shouting should be prohibited;
- The setup of lines of communication between the Client and sensitive neighbours to avoid/deal with possible complaints should be considered;
- Rapid and thorough investigation of any noise complaint regarding the service yard, identification of the causes, and implementation of remedial measures to rectify the situation.

9.0 CONCLUSION

A detailed 7 day environmental noise survey has been undertaken at the proposed Adams Food Ingredients site, off Sunnyhills Road, Leek.

Based on the results of the environmental noise survey and the guidance given within applicable standards a noise impact assessment has been undertaken of the proposed operation of the service yard.

Delivery noise has been assessed by considering the change in ambient noise level over an hourly period (daytime) and 5 minute period (night-time) in which a delivery takes place, and the consequential typical human response to the change. The results suggest a significant change in noise levels during the night-time and a imperceptible change in noise levels during the daytime.

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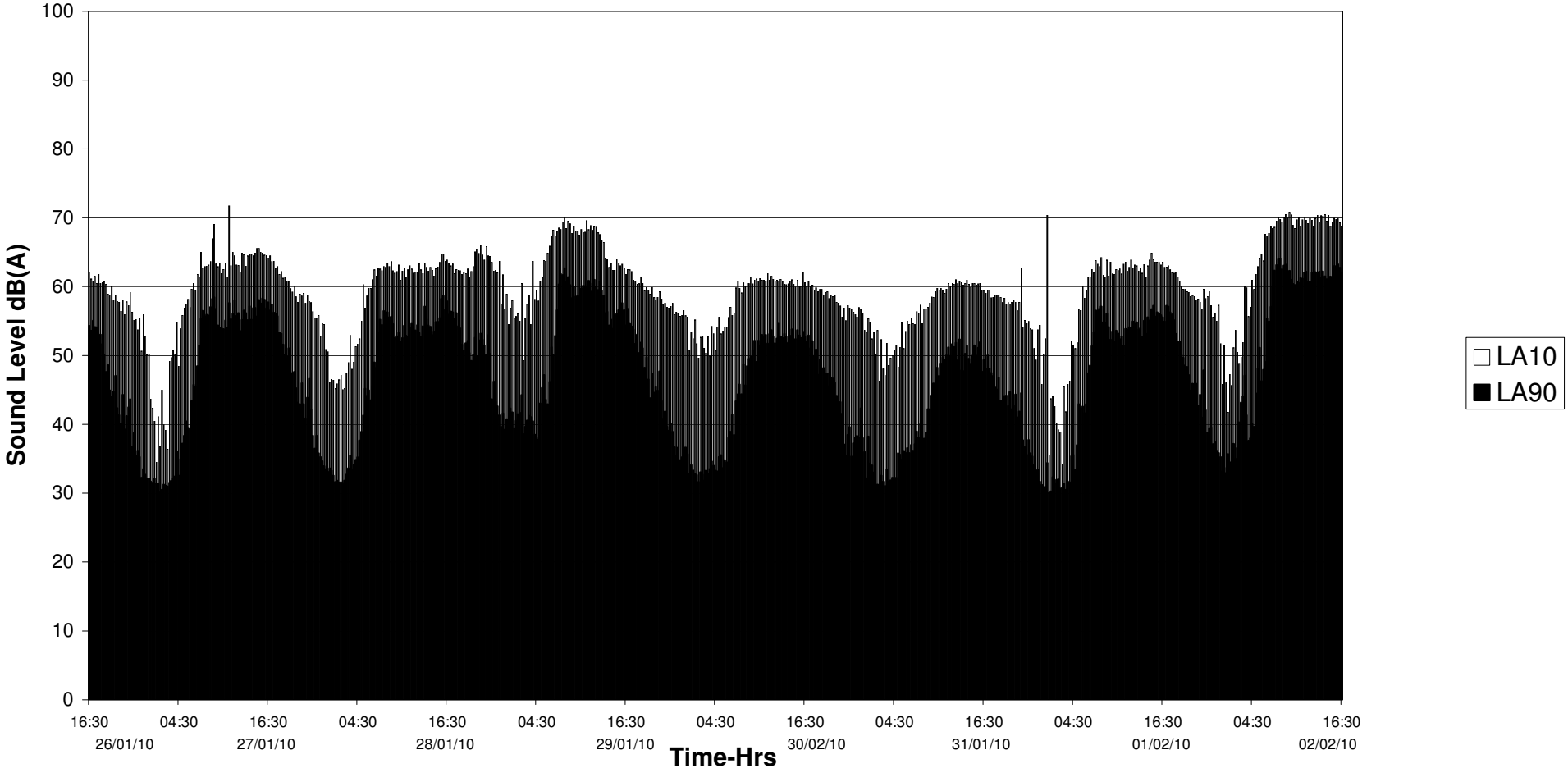
Adams Food Ingredients, Leek

L_{A10} and L_{A90} Noise Levels - Position 1

Tuesday 26 January 2010 to Tuesday 2 February 2010

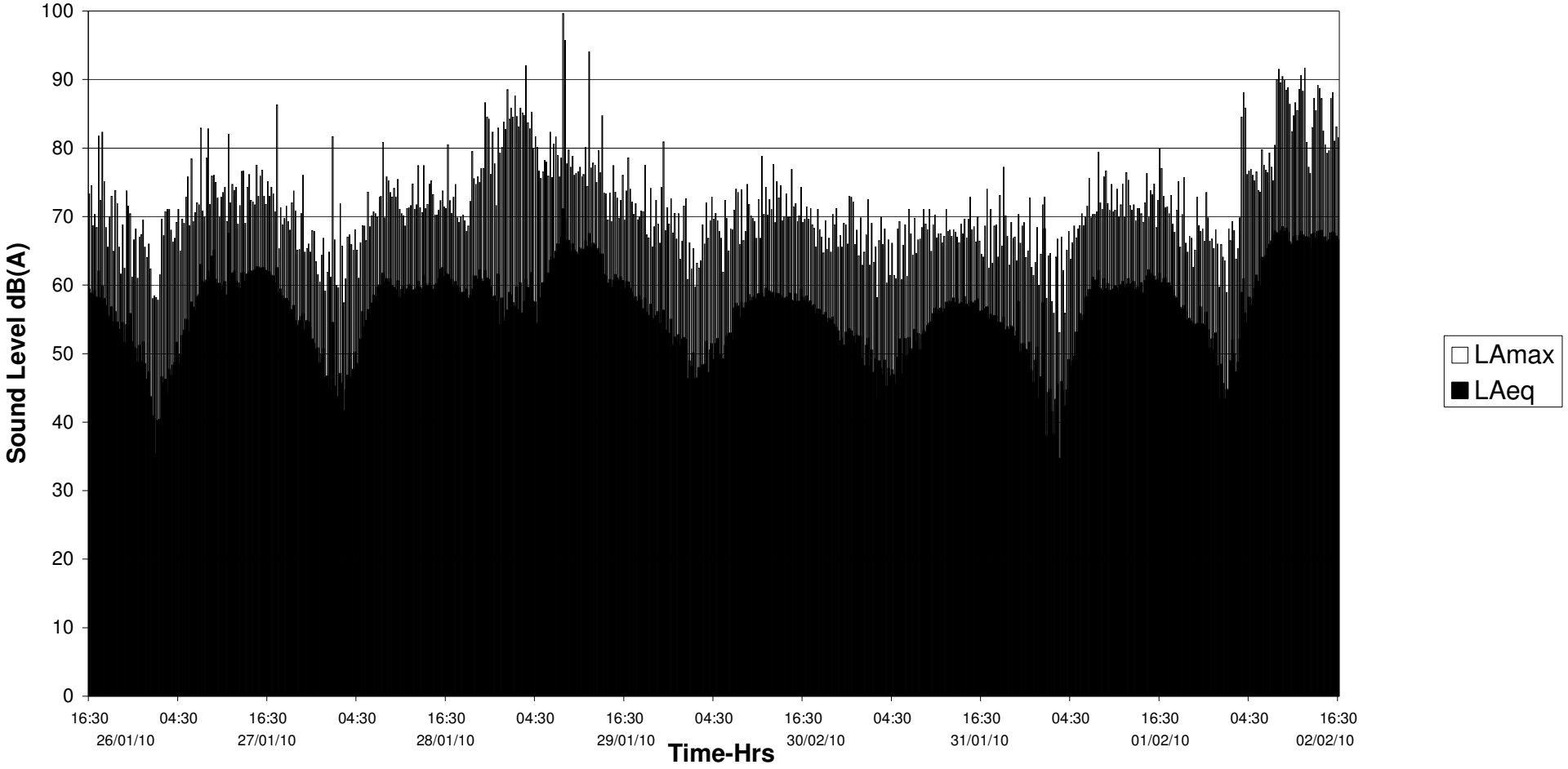


16166/TH1

Adams Food Ingredients, Leek

L_{Aeq} and L_{Amax} Noise Levels - Position 1

Tuesday 26 January 2010 to Tuesday 2 February 2010



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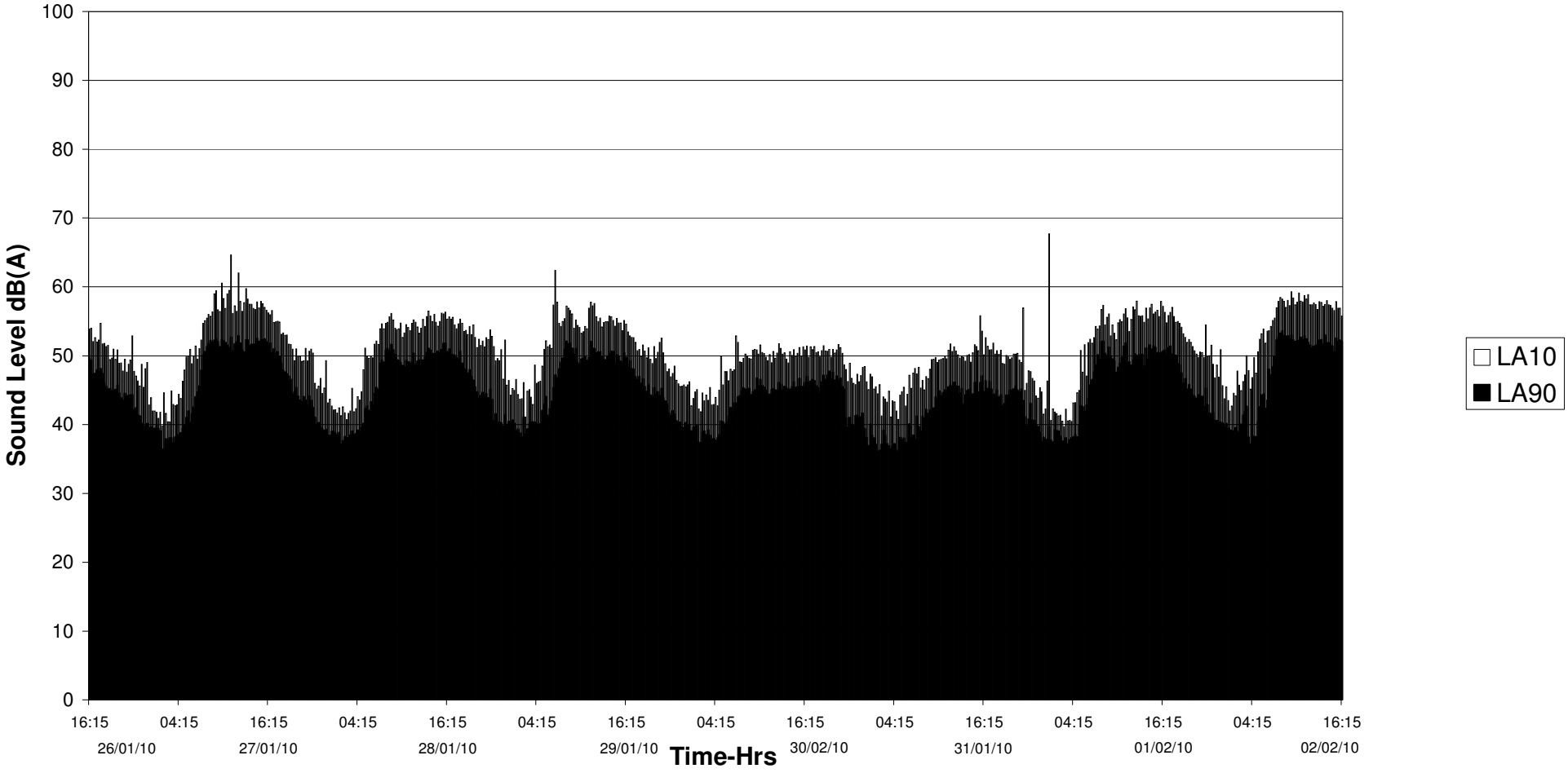
Adams Food Ingredients, Leek

L_{A10} and L_{A90} Noise Levels - Position 2

Tuesday 26 January 2010 to Tuesday 2 February 2010

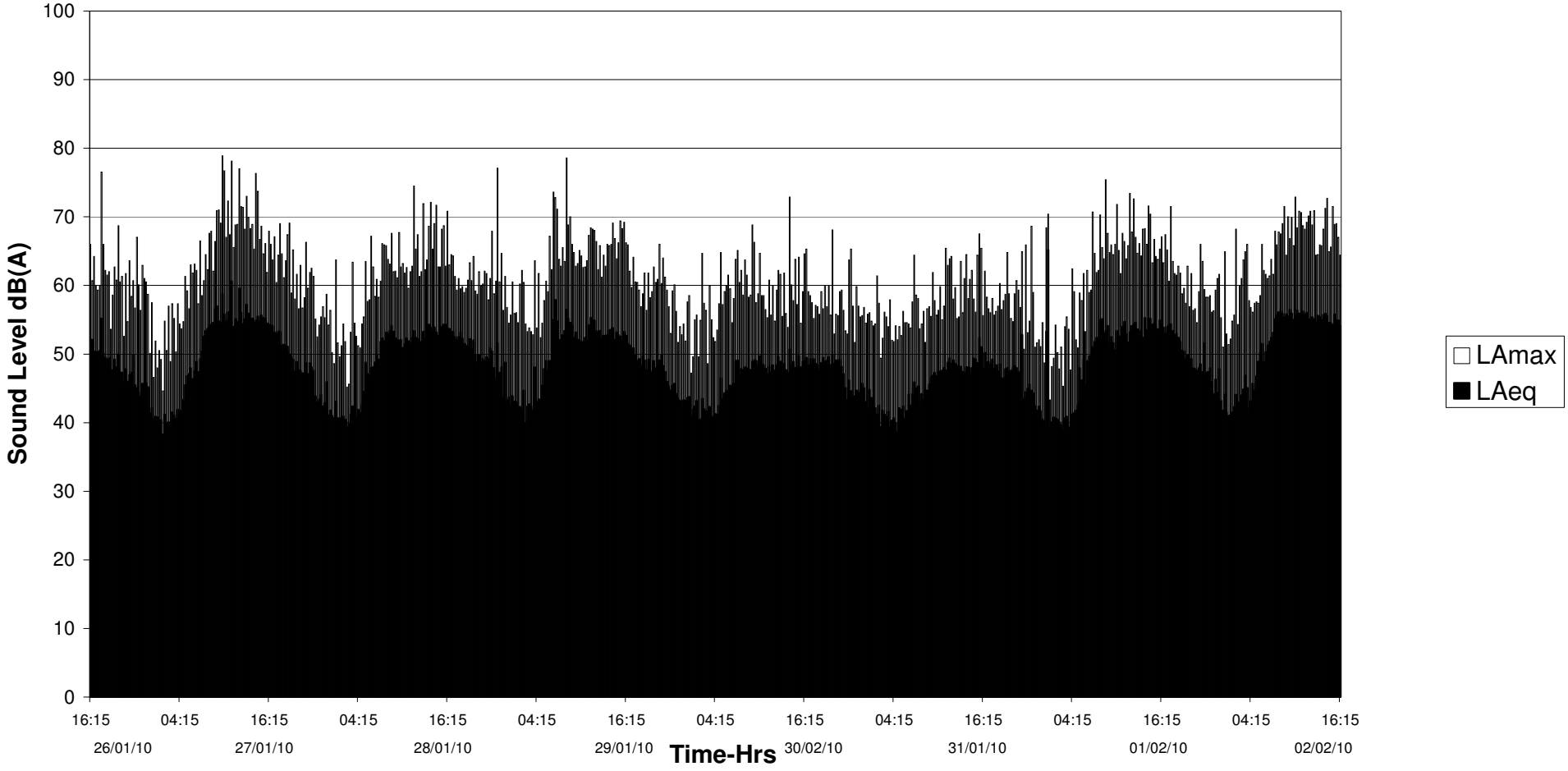


16166/TH3

Adams Food Ingredients, Leek

L_{Aeq} and L_{Amax} Noise Levels - Position 2

Tuesday 26 January 2010 to Tuesday 2 February 2010



16166/TH4

APPENDIX A
ACOUSTIC TERMINOLOGY

The acoustic terms used in this report are as follows:

dB : Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level.

dB(A) : The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level.

Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.

L_{10} & L_{90}: If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The Ln indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L_{10} is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.

It is common practice to use the L_{10} index to describe traffic noise, as being a high average, it takes into account the increased annoyance that results from the non-steady nature of traffic noise.

L_{eq} : The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise.

L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (e.g. 1 hour).

The use of digital technology in sound level meters now makes the measurement of L_{eq} very straightforward.

L_{max} : L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Free-field : A sound level determined at a point away from reflective surfaces other than the ground with no significant contributions due to sound from other reflective surfaces can be described as a 'free-field' measurement.

SEL : Sound Exposure Level - Used for assessing the acoustic energy of a particular event, such as an individual train or car passby. It is the notional steady sound level which over a one second period would contain the same amount of acoustic energy as the actual event recorded over a specified time period.

The SEL is related to the L_{eq} by the equation:

$$L_{eq(T)} = SEL + 10\log_{10}(N) - 10\log_{10}(T)$$

where N = number of events during time period, T
T = time period of interest e.g. 1 hour, 5 minutes, etc

APPENDIX B
NOISE IMPACT ASSESSMENT CALCULATIONS – NIGHT-TIME (23:00 – 07:00)

Receptor A : Newcastle Road South

Distance (m) to service yard	20
Screening to service yard	Yes
Mean distance to delivery route (m)	45
Screening to delivery route	None
Assessment Interval (seconds)	300

Event	HGV Arrival	Loading / Unloading (HGV Idling)	Forklift Loading / Unloading	HGV Departure
L_{eq} at 5m (dBA)	74.5	70.0	66	75.6
SEL (dBA)	96.3	94.8	80.8	97.4
Number of Events	1	1	12	1
$L_{eq,5mins}$ at 5m (dBA)	71.5	70.0	66.8	72.6
Distance loss (dB)	-19.1	-12.0	-12.0	-19.1
Screening loss (dB)	0.0	-13.0	-13.0	0.0
Noise Level at Receptor $L_{eq,5mins}$ (dBA)	52.4	45.0	41.8	53.5
Combined Noise Level $L_{eq,5mins}$ (dBA)	56.5			
Ambient Level $L_{eq,15mins}$(dBA)	35.0			
Event + Existing Ambient (dBA)	56.5			
Increase in Ambient Noise	**21.5**			

APPENDIX B
NOISE IMPACT ASSESSMENT CALCULATIONS – DAYTIME (07:00 – 23:00)

Receptor A : Newcastle Road South

Distance (m) to service yard	20
Screening to service yard	Yes
Mean distance to delivery route (m)	45
Screening to delivery route	None
Assessment Interval (seconds)	3600

Event	HGV Arrival	Loading / Unloading (HGV Idling)	Forklift Loading / Unloading	HGV Departure	Small Van Arrival	Forklift Loading / Unloading	Small Van Departure	Waste Collection Arrival	Waste Collection Departure
L_{eq} at 5m (dBA)	74.5	70.0	66	74.5	61.7	66	62.5	74.5	74.5
SEL (dBA)	96.3	105.6	80.8	96.3	76.5	80.8	77.3	96.3	96.3
Number of Events	1	1	12	1	2	6	2	1	1
$L_{eq,15mins}$ at 5m (dBA)	60.7	70.0	56.0	60.7	43.9	53.0	44.7	60.7	60.7
Distance loss (dB)	-19.1	-12.0	-12.0	-19.1	-19.1	-18.1	-19.1	-22.9	-22.9
Screening loss (dB)	0.0	-13.0	-13.0	0.0	0.0	-8.5	0.0	-7.2	-7.2
Noise Level at Receptor $L_{eq,1\ hour}$ (dBA)	41.6	45.0	31.0	41.6	24.8	26.4	25.6	30.6	30.6
Combined Noise Level $L_{eq,1\ hour}$ (dBA)					48.1				
Ambient Level $L_{eq,1\ hour}$(dBA)					51.0				
Event + Existing Ambient (dBA)					52.8				
Increase in Ambient Noise					**1.8**				

HT: 16166/AS1 **19/02/2010**

ADAMS FOOD INGREDIENTS, LEEK

ACOUSTIC SPECIFICATION FOR

ACOUSTIC SCREEN
(TIMBER)

Acoustic screening shall extend continuously along the Northern boundary of the service yard and should be of a height sufficient to provide at least line of sight screening between the service yard and the nearest residential receptor.

The screen shall be imperforate (solid) and have a minimum mass per unit area of at least 10kg/m^2. This could be achieved using two or more layers of a wide range of materials including, for example, plywood or OSB board or equivalent sheeting board to a suitable thickness required to achieve the mass per unit area. All junctions should be staggered.

Doors, access panels and service penetrations shall be treated so as to maintain the acoustic performance of the assembled screen.

All junctions between the screen and adjacent structures shall be made good and sealed with a heavy grout and/or dense non-hardening mastic.

The complete structure shall be wind and weather resistant to standards agreed with the Client.

The exact design of the screen will be agreed with and approved by Hann Tucker Associates.

SUITABLE SUPPLIERS

of

ACOUSTIC FENCING

Name & Address	Telephone Number	Contact
Buffalo Structures Ipsden Nr Wallingford Oxfordshire OX10 6BS	01491 838368 (Timber fencing)	Mark Bailey
ETS Ltd Newton Brae Foulden Berwick Upon Tweed TD15 1UL	01289 386664 (Green barrier)	Allan Jardine
Graham Barrier Systems Ltd The Stables Codham Hall Great Warley Brentwood Essex CM13 3JT	01323 872243	Steve Whittle
May Gurnley Ltd The Old Abattoir Elsing Dereham Norfolk NR20 3EW	01603 879054	Graham Camplin