Seqens, Billingham

Billingham Plant 5.1 Project: Proposed Multi-Purpose Process Unit

Acoustic Assessment

Project Number: 60609533_Acoustic_1

4 October 2019

Quality information

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Revision History

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1. Introduction

1.1 Purpose

Seqens Custom Specialties (formerly Chemoxy International Ltd) is proposing to construct and operate a new additional multi-purpose process unit at their Billingham site, Stockton-on-Tees.

AECOM have been commission by Seqens to undertake a noise assessment to support the variation to the existing EPR Permit BT9844IK for the site.

A brief summary of noise terminology used within this report is provided in Appendix A.

1.2 Scope of Assessment

The assessment presented in this report covers the following items:

- Measure baseline sound levels at locations representative of the closest noise sensitive receptors to the site.
- Measure sound levels of existing operational plant on the site which are equivalent to the new plant to be installed.
- Carry out acoustic modelling work to quantify the noise impacts to surrounding sensitive receptors from the operation of the proposed multi-purpose processing unit and associated external plant.
- Carry out an assessment according to the requirements of BS 4142: 2014 and determine if the calculated sound levels at the off-site receptors will result in an adverse noise impact.
- Provide a report detailing all measurements, computer modelling, calculations and assessment work, suitable for submission to the Environmental Agency to support the permit variation application.

1.3 Proposed Development and the Billingham Site

The existing Seqens site in Billingham is situated within the centre of the Billingham Chemicals Complex. To the north, south and east of the site are a number of other industrial businesses, which are predominantly chemical processing plants. To the west and south-west are residential areas.

The operating hours of the multi-purpose processing unit and associated plant are assumed to be 24 hours a day, hence day (07:00 to 23:00) and night-time (23:00 to 07:00) operational noise impacts have been assessed for the proposed plant.

The nearest sensitive receptors included in the assessment are detailed in in Table 1.1 and shown in Figure B.1, Appendix B.

Table 1.1 Nearest Receptors

Receptor	Distance to site boundary (m)	Direction from Site
R1 – 49 Roscoe Road	685	West
R2 – 85 Roscoe Road	735	West
R3 – 61 Mill Lane	750	South-West

2. Planning Policy and Guidance

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was introduced in March 2012 and revised in February 2019[1], with a further amendment in June 2019. The document sets out the Government's planning policies for England and how these are expected to be applied.

Applications for planning permission must be determined in accordance with the Local Authority development plan (which includes any local plan or neighbourhood plans which have been adopted for the area), unless material considerations indicate otherwise.

The planning system is required to contribute to and enhance the natural and local environment. Consequently, the aim is to prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution.

The NPPF states that planning policies and decisions should aim to:

- 'mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise from giving rise to significant adverse impacts on health and quality of life; and
- identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'.

With regards to 'adverse effects' and 'significant adverse effects' the NPPF refers to the Noise Policy Statement for England Explanatory Note (NPSE) [2].

2.2 Noise Policy Statement for England

The statement sets out the long-term vision of the government's noise policy, which is to 'promote good health and a good quality of life through the effective management of noise within the context of policy on sustainable development'.

This long-term vision is supported by three aims:

- 'avoid significant adverse impacts on health and quality of life;
- mitigate and minimise adverse impacts on health and quality of life; and
- Where possible, contribute to the improvements of health and quality of life.'

The long-term policy vision and aims are designed to enable decisions to be made regarding what is an acceptable noise burden to place on society.

The 'Explanatory Note' within the NPSE provides further guidance on defining 'significant adverse effects' and 'adverse effects' using the concepts:

- No Observed Effect Level (NOEL) - the level below which no effect can be detected. Below this level no detectable effect on health and quality of life due to noise can be established;
- Lowest Observable Adverse Effect Level (LOAEL) - the level above which adverse effects on health and quality of life can be detected; and

1 Department for Communities and Local Government (2019) National Planning Policy Framework, DCLG, London

2 Department for the Environment Food and Rural Affairs (2010) Noise Policy Statement for England, Defra.

- Significant Observed Adverse Effect Level (SOAEL) - the level above which significant adverse effects on health and quality of life occur.

The three aims can therefore be interpreted as follows:

- the first aim is to avoid noise levels above the SOAEL;
- the second aim considers situations where noise levels are between the LOAEL and SOAEL. In such circumstances, all reasonable steps should be taken to mitigate and minimise the effects. However, this does not mean that such adverse effects cannot occur; and
- the third aim considers situations where noise levels are between the LOAEL and NOEL. In these circumstances, where possible, reductions in noise levels should be sought through the pro-active management of noise.

The NPSE recognises that it is not possible to have single objective noise-based measures that define the SOAEL, LOAEL and NOEL that are applicable to all sources of noise in all situations. The levels are likely to be different for different noise sources, receptors and at different times of the day.

2.3 Planning Practice Guidance web-based resource

In March 2014, the Department for Communities and Local Government (DCLG) released its Planning Practice Guidance (PPG) web-based resource[3] to support the NPPF. The guidance advises that local planning authorities' should consider:

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

This guidance introduced the additional concepts of NOAEL (No Observed Adverse Effect Level), and UAEL (Unacceptable Adverse Effect Level). Full details of the Planning Practice Guidance on effects are provided in Table 2.1.

3 http://planningguidance.planningportal.gov.uk/blog/guidance/noise/noise-guidance/

Table 2.1 PPG Guidance

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Factors to be considered in determining if noise is a concern are identified including the absolute noise level of the source, the existing ambient noise climate, time of day, frequency of occurrence, duration, character of the noise and cumulative impacts.

2.4 BS 4142

Response to sound is subjective and affected by many factors (acoustic and non-acoustic). In general, the likelihood of complaints in response to sound depends on factors including the margin by which it exceeds the background sound level, its absolute level, character of the sound, time of day, change in the sound environment as well as local attitudes to the installation and the nature of the local area. The latest iteration of the standard used for assessing industrial sound and determining community reaction is British Standard BS 4142: 2014 'Methods for rating and assessing industrial and commercial sound' [4]. According to the standard, it can be used for:

- "investigating complaints;
- assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and
- assessing sound at proposed new dwellings or premises used for residential purposes."

The basis of BS 4142 is a comparison between the background sound level in the vicinity of residential locations and the rating level of the noise source under consideration. The relevant parameters in this instance are as follows:

- *Background Sound Level* – $L_{A90,T}$ – defined in the Standard as the 'A' weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels;
- *Specific Sound Level* – $L_{Aeq,Tr}$ – the equivalent continuous 'A' weighted sound pressure level produced by the specific sound source at the assessment location over a given time interval, T_r;
- *Residual Sound Level* - $L_{Aeq,T}$ - the equivalent continuous 'A' weighted sound pressure level at the assessment location in the absence of the specific sound source under consideration, over a given time interval, T; and
- *Rating Level* – $L_{Ar,Tr}$ – the specific sound level plus any adjustment made for the characteristic features of the noise such as tonality, impulsivity and intermittency.

When comparing the *Background Sound Level* and the *Rating Level*, the standard states that:

- "Typically, the greater the difference, the greater the magnitude of impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending upon the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending upon the context.
- The lower the *Rating Level* is compared to the measured *Background Sound Level*, the less likely it is that the specific sound will have an adverse impact or a significant adverse impact. Where the *Rating Level* does not exceed the *Background Sound Level*, this is an indication of the specific sound source having a low impact, depending upon the context."

4 British Standard 4142: 2014 'Methods for rating and assessing industrial and commercial sound'. British Standards Institute. 2014

Importantly, as indicated above, BS 4142:2014 requires that the *Rating Level* of the sound source under assessment be considered in the context of the environment when defining the overall significance of the impact. The standard suggests that in assessing the context, all pertinent factors should be taken into consideration, including the following:

- “The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.”

2.5 Consultation

Pre-application consultation was undertaken by AECOM with the Environment Agency. No concerns were raised with regards to noise impacts upon the closest noise sensitive properties.

3. Sound Monitoring

3.1 Baseline Sound Survey Monitoring Procedure

Short-term attended sound measurements at two noise sensitive locations were carried out on Tuesday 23rd and Wednesday 24th July 2019, during daytime and night-time periods.

The locations were chosen as they were deemed representative of the properties located to the west and south-west of the site.

The sound monitoring locations, and start and finish times, are given in Table 3.1

Table 3.1 Noise Monitoring Locations and Durations

Location	Details	Date	Daytime		Night-time	
			Start-Time	End Time	Start-Time	End Time
M1	Roscoe Road – on the green space located to the front of no. 49	23/07/2019	14:20	15:20	22:45	00:00
		24/07/2019	13:47	14:17	-	-
M2	Mill Lane – to the front of no, 53	23/07/2019	15:26	14:06	23:00	00:00
		24/07/2019	13:44	14:14	-	-

The baseline sound monitoring was carried out in accordance with measurement guidance in British Standard BS 7445: 2003 'Description and Measurement of Environmental Noise' [5].

The sound level meters were set to measure the L_{Aeq} and L_{A90} parameters, logging in contiguous periods of 15 minutes. All baseline sound measurements were taken at a height of between 1.2 and 1.5 metres above ground level and located in free-field conditions (at least 3.5 metres from any vertical reflecting surfaces).

The sound monitoring locations are shown in Figure B.1, Appendix B. Details of the instrumentation used are presented in Appendix C. All equipment was checked with a field calibrator before and after the measurement. No significant drift in calibration was noted (±0.2 dB). Calibration certificates are available on request.

3.2 Meteorological Conditions

The weather during the monitoring periods was dry with average wind speeds less than 5 m/s from a south/ south-westerly direction.

Further information is provided within Table C.1, Appendix C.

5 BS 7445: 2003 'Description and Measurement of Environmental Noise'. British Standards Institution.

3.3 Survey Results

The measured data were processed to derive representative ambient (L_{Aeq}) and minimum background sound levels for the day (07:00 to 23:00) and night (23:00 to 07:00) periods. The results are presented in Table 3.2.

Table 3.2 Measured Background Sound Levels

Location	Representative Ambient Sound Levels L_{Aeq} dB		Minimum Background Sound Levels L_{A90} dB	
	Day (07:00-23:00)	Night (23:00-07:00)	Day (07:00-23:00)	Night (23:00-07:00)
M1	52	44	45	42
M2	58	50	43	46

At sound monitoring location M1 (Roscoe Road), the dominant sound was from industrial sources at Billingham Chemicals Complex, noted as originating from the CF Fertilisers UK Limited manufacturing plant located to the north of the Seqens site. Distant road traffic was also audible, along with occasional vehicle pass-bys on Roscoe Road.

At location M2, the dominant sound source was again industrial noise from the Billingham Chemicals Complex, and road traffic on New Road.

3.4 Specific Sound Measurements

In addition to the baseline sound survey, measurements were also undertaken of equivalent items of fixed plant located at the existing multi-purpose processing facility at the site. These data have been used to derive sound power levels to incorporate in the noise model. Details of the derived sound power levels are given in Appendix D.

4. Sound Assessment

4.1 Methodology

A model of the proposed multi-purpose processing unit and the surrounding area has been developed using the SoundPLAN (v8) sound modelling software, and includes the ground topography, existing buildings and residential properties around the site. The software implements the standard sound prediction methodology detailed in ISO 9613:1996 [6].

The Ordnance Survey base mapping and the layout of the existing buildings on the site have been obtained from commercially available mapping [7]. The design details for the proposed multi-purpose processing unit and associated plant have been taken from the engineers drawings provided by the client. The following heights have been used in the model:

- All pumps (other than P526) are located 0.5m above the platform level for each pump.
- Pump P526 is located 16m above ground level
- Agitator AG501 is located 8m above ground level.
- The column/stack outlet is 35m above ground level.

Octave band sound power levels for the proposed items of plant were derived from measurements of equivalent plant located at the existing multi-purpose processing facility at the site. Details of the sound power level data incorporated in the acoustic model are given in Table D.1 in Appendix D. To ensure a worst-case assessment, the highest measured sound pressure level for each item of proposed plant has been used to derive the sound power level.

The model has been used to calculate sound levels at representative sensitive receptors and an assessment carried in accordance with BS 4142 to determine if the calculated rating levels will result in a significant noise impact.

6 International Organization for Standardization (1996) ISO 9613: 1996 Part 2 Attenuation of sound during propagation outdoors, ISO.

7 Ordnance.survey.co.uk/opendatadownload

4.2 Specific Sound Predictions

Specific sound levels have been predicted due to the operation of the multi-purpose processing unit during the daytime and night-time at each of the identified sensitive receptors. Details of the noise level data employed in the acoustic model are given in Appendix D. The predicted sound levels are provided in Table 4.1.

Table 4.1 Predicted Free-field Specific Sound Levels at Receptors

Receptor	Distance from Site boundary (m)	Floor/Period	*Specific Sound Level* ($L_{Aeq,Tr}$ dB)
R1 – 49 Roscoe Road	685	Ground Floor / Day	25
		First Floor / Night	28
R2 – 85 Roscoe Road	735	Ground Floor / Day	23
		First Floor / Night	28
R3 – 61 Mill Lane	750	Ground Floor / Day	20
		First Floor / Night	22

4.3 Assessment

Based on experience from similar processing facilities and professional judgement, and to ensure a worst-case assessment, a +2 dB penalty has been applied for tonality that may be just perceptible at the closest noise sensitive receptors.

It is not expected that there will be impulsive features associated with the proposed plant. Therefore, no penalty for impulsivity has been applied.

The proposed plant will generally operate continuously, and hence no penalty for intermittency is applicable.

Following the procedures outlined in BS 4142: 2014, the *Rating Level* has been compared to the *Background Sound Level*, as shown in Table 4.2.

Table 4.2 Sound Assessment

Receptor	Period	*Specific Sound Level* ($L_{Aeq,Tr}$ dB)	*Rating Level* ($L_{Ar,Tr}$ dB)	*Background Level* (L_{A90} dB)	*Rating Level* minus *Background* (dB)	Conclusion from BS 4142
R1	Day	25	27	45	-18	Low impact, depending on context
	Night	28	30	42	-12	Low impact, depending on context
R2	Day	23	25	45	-20	Low impact, depending on context
	Night	28	29	42	-12	Low impact, depending on context
R3	Day	20	22	43	-21	Low impact, depending on context
	Night	22	24	43*	-19	Low impact, depending on context

* The minimum L_{A90} at night was higher than that during the day. For a worst-case assessment, the daytime L_{A90} has been used to represent the night-time L_{A90}.

Table 4.2 shows that the *rating levels* at the receptors are well below the lowest measured *background sound levels* during both the daytime and night-time periods. This indicates that the operation of the proposed multi-purpose processing unit will not result in significant levels incident upon the closest noise sensitive receptors and is considered to be of low impact.

The context is that various items of fixed plant will be installed within an existing industrial/commercial area and the installation of the new plant is highly unlikely to alter the current soundscape.

It is noted that the modelling undertaken assumes that the proposed multi-purpose processing unit will be operational 100% of the time, thus providing a worst-case assessment.

The author and reviewer’s qualifications and experience are provided in Appendix E.

5. Conclusions

An assessment of noise from the operation of a proposed multi-purpose processing unit at the Seqens site at the Billingham Chemicals Complex, Billingham has been carried out. The assessment is a worst-case assessment as it assumes that the external plant will have an operational on-time of 100% during both daytime and night-time periods, and predicted noise levels have been assessed against the lowest measured background sound levels at the closest noise sensitive receptors.

Sound levels at the closest receptors due to operation of the proposed multi-purpose processing unit have been predicted. The *Rating Levels* at the receptors are greater than 10 dB below the *Background Sound Levels* at all receptors during both the daytime and night-time periods. This therefore indicates that the sound levels incident on the closest receptors will not be significant, and the sound from the new multi-purpose processing unit is considered to be of low impact.

Appendix A: Glossary of Terms

Between the quietest audible sound and the loudest tolerable sound there is a million to one ratio in sound pressure (measured in Pascals, Pa). Because of this wide range, a sound level scale based on logarithms is used in acoustic measurement called the decibel (dB) scale. Audibility of sound covers a range of approximately 0 to 140 dB. The human ear system does not respond uniformly to sound across the detectable frequency range and consequently instrumentation used to measure sound is weighted to represent the performance of the ear. This is known as the 'A weighting' and annotated as dB(A). Table A.1 lists the sound pressure level in dB(A) for common situations.

Table A.1: Noise Levels for Common Situations

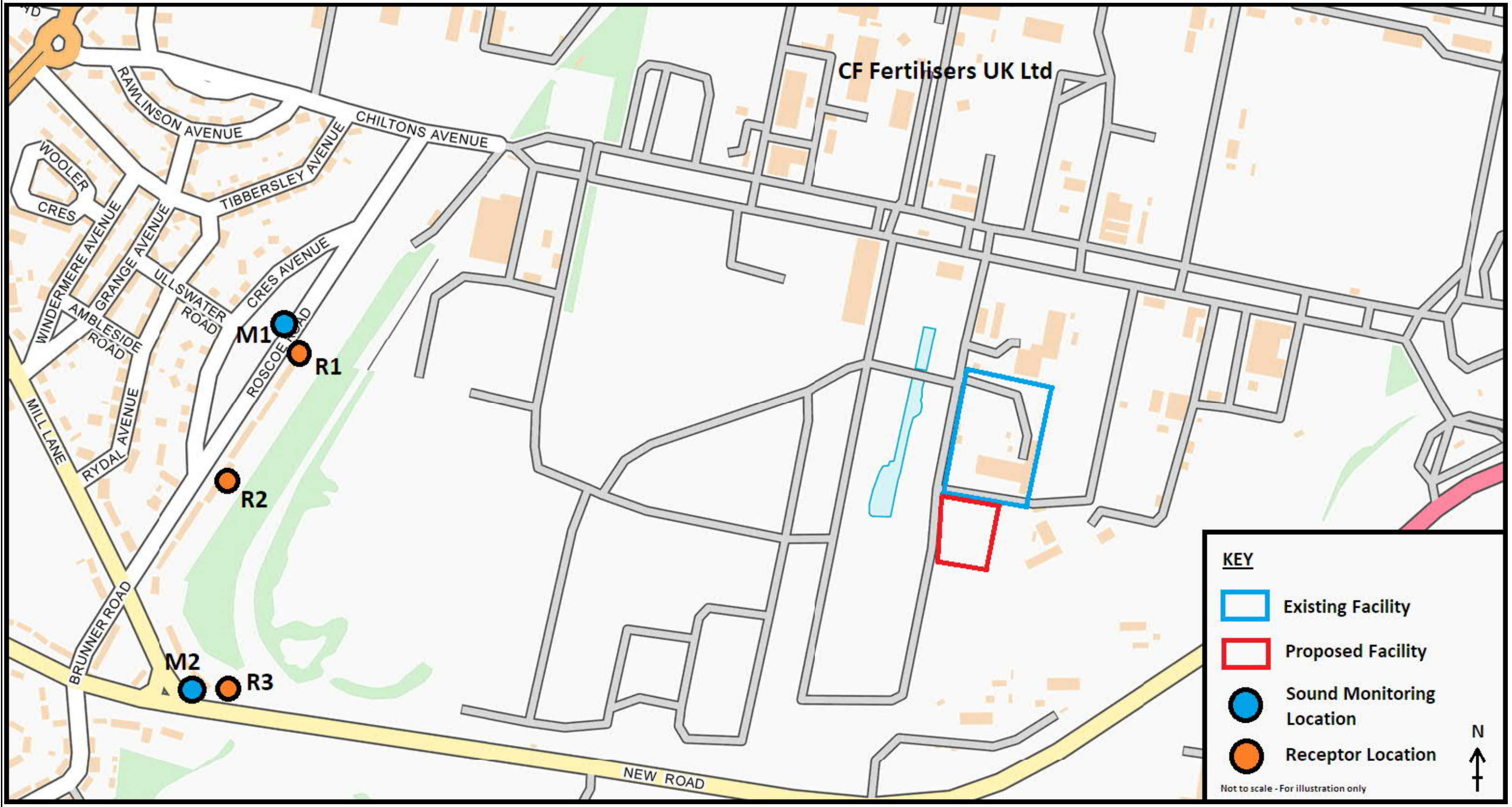
Approximate Sound Pressure Levels (dB(A))	Example
0	Threshold of hearing
30	Rural area at night
50	Quiet office, no machinery
80	General factory noise level
100	Pneumatic drill
140	Threshold of pain

The sound level at a measurement point is rarely steady, even in rural areas, and varies over a range dependent upon the effects of local sound sources. Close to a busy motorway, the sound level may vary over a range of 5 dB(A), whereas in a suburban area this variation may be up to 40 dB(A) and more due to the multitude of sound sources in such areas (cars, dogs, aircraft etc.) and their variable operation. Furthermore, the range of night-time sound levels will often be smaller and the levels significantly reduced compared to daytime levels. When considering environmental sound, it is necessary to consider how to quantify the existing sound (the ambient noise) to account for these second to second variations.

A parameter that is widely accepted as reflecting human perception of the ambient noise is the background sound level, L_{A90}. This is the sound level exceeded for 90 % of the measurement period and generally reflects the sound level in the lulls between individual events. Over a one hour period, the L_{A90} will be the sound level exceeded for 54 minutes.

The equivalent continuous A-weighted sound pressure level, L_{Aeq} is the single number that represents the total sound energy measured over that period. L_{Aeq} is the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period.

Appendix B: Monitoring and Receptor Locations



NOTES

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Appendix C: Sound Monitoring Details

Sound Monitoring Equipment

The following equipment was used for the noise monitoring exercise:

- Location M1 – Norsonic 140 Class 1 integrating sound level meter, S/N: 1403909.
- Location M2 (daytime) – Norsonic 140 Class 1 integrating sound level meter, S/N: 14030909.
- Location M2 (night) - Norsonic 118 Class 1 integrating sound level meter, S/N: 31509
- Norsonic Field Calibrators, S/Ns: 34393 and 27485.

All measurements were taken between 1.2 and 1.5 m above local ground level and were located more than 3.5 m from any vertical reflecting surfaces and as such can be considered to be free-field.

Weather Conditions

Table C.1: Weather Conditions

Date	Timeof Day	Temperature ˚C Range	Average Wind Speed m/s	Precipitation
Tuesday 23rd July 2019	Day	26-27	2-5	Dry
Wednesday 24th July 2019	Night	20	2	Dry
Source: Observations made on site				

Appendix D: Sound Model Inputs

Data sources

OS mapping: Downloaded from Ordnance.survey.co.uk/opendatadownload

Ground elevation data for surrounding area from environment.data.gov.uk/ds/survey#/

Scheme foundation design diagrams, including proposed ground heights, provided by Seqens/Chemoxy International Ltd

3D and elevation drawings of provided by Ian Armitage, Seqens/Chemoxy International Ltd 22/08/2019

Plant list provided by Michael Thompson, Plant Manager, Seqens/Chemoxy International Ltd 15/07/2019

Modelling assumptions & parameters

Ground Absorption: 0.0 for site and nearby surroundings.

Ground Absorption: 0.3 for intervening ground between site and residential properties (rough waste land).

Ground Absorption: 0.6 at residential receptors.

(Note: Acoustically Soft = 1, Acoustically Hard = 0)

Calculation grid size: 5m

Other Settings

Order of Reflections = 3

ISO 9613 prediction methodologies

Receptor heights: 1.5m for ground floor height

4m for first floor height

Table D.1: Sound Power Level Data

Item	Octave Band Linear Sound Pressure Level (dB)												Overall Sound Power Level dBA	Source
	8Hz	16Hz	31.5Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	16kHz		
FN501A / FN501B (Cooling Tower)	88.0	83.2	82.2	91.3	87.3	80.4	75.2	73.8	69.7	70.2	65.0	51.2	80.0	Overall L_w level derived from measurements of equivalent plant on site
Cooling Tower Louvre	72.9	71.5	67.2	69.8	65.5	64.2	72.1	73.4	72.4	74.1	72.8	67.7	80.0	Overall L_w level derived from measurements of equivalent plant on site
AG501 Agitator	84.6	82.3	80.5	81.6	82.5	83.2	83.0	88.8	79.3	83.4	71.1	66.9	91.1	Overall L_w level derived from measurements of equivalent plant on site
P501–P505, P507-P511, P522–P524	76.6	79.3	76.6	78.6	82.0	82.6	85.9	83.6	81.4	78.4	76.9	70.7	88.7	Overall L_w level derived from measurements of equivalent plant on site
P506A / P506B	70.9	74.8	77.0	78.9	80.0	82.3	82.4	85.7	87.7	82.6	73.3	69.1	91.8	Overall L_w level derived from measurements of equivalent plant on site
P512–P513, P516	69.9	77.1	77.9	75.8	80.6	84.7	89.4	85.6	85.5	83.3	79.1	72.6	92.1	Overall L_w level derived from measurements of equivalent plant on site
P514–P515, P517–P521, P525-P526	73.4	77.0	71.5	74.9	73.6	72.5	73.6	73.5	68.5	66.8	66.5	65.7	77.5	Overall L_w level derived from measurements of equivalent plant on site

Appendix E: BS4142 Assessment

Qualifications and Experience

Ruth Sargent BSc(Hons) MSC MIOA – Assessment

Ruth has spent 15 years working on noise and vibration related projects. Since completing a Bachelors degree in Environmental Science, a Master's degree in Environmental management and a Diploma in Acoustics and Noise Control, she has gained a wide range of practical experience in Environmental acoustics and vibration in a consultancy role. Ruth is a Corporate Member of the Institute of Acoustics.

The majority of Ruth's experience relates to the provision of noise and vibration impact assessments to support planning applications and full Environmental Impact Assessments. These include large residential and mixed-use schemes, power related developments and quarry/waste/sewage treatment facilities.

She is experienced in the use of environmental noise modelling software SoundPLAN, which implements a range of methodologies including Calculation of Road Traffic Noise (CRTN), Calculation of Railway Noise (CRN), BS 5228 and ISO 9613-2.

Alf Maneylaws BSc MSc MIOA – Technical Review

Alf is a member of the Institute of Acoustics and joined AECOM in 2002 from International Mining Consultants (IMC). At IMC he was responsible for a number of medium-term research projects dealing with environmental and occupational noise and vibration impact assessments and machinery noise control for the opencast and deep mine industries.

Alf provides consultancy services across a broad range of areas within the noise and vibration field, including environmental impact assessments, particularly in respect of major transport schemes, complex commercial and industrial sites, residential / mixed use developments, industrial noise assessments in accordance with The Control of Noise at Work Regulations 2005, and building and architectural acoustics.

He is expert in the use of a range of sound prediction packages, including the environmental sound modelling software SoundPLAN.

He has developed significant experience in dealing with public concerns, having attended numerous public exhibitions for major road schemes for which he provided noise impact assessments.

He has appeared as expert witness at the public inquiries for a number of road schemes and has provided written evidence for two large industrial developments for which the noise issues were agreed in the statement of common ground.

Context

The closest identified receptors to the proposed development site are residential in nature and are therefore classed as of high sensitivity. The dominant existing sound source at the nearest receptors is from industrial noise from the Billingham Chemicals Complex located to the east/ north-east. As would be expected, ambient sound levels are lower at night then during the day. However, background sound levels only drop slightly at night, likely due to the industrial nature of the surrounding land uses.

Uncertainty

Some uncertainty in the measured data and calculations is unavoidable. With regards to the measured data, this has been minimised as follows:

- undertaking 7 days of baseline sound monitoring. This enabled a comprehensive consideration of the baseline sound levels at the receptors, ensuring that the adopted background sound levels were representative of the relevant time periods;
- use of suitable Class 1 sound level meters which comply with the relevant standards and have been calibrated at a UKAS accredited laboratory within the previous year; and
- field calibration of the measurement system on site at the start and end of each monitoring period.

With regards to the calculations, uncertainties have been minimised through the use of a reputable noise mapping software package (SoundPLAN) which implements a validated method of calculation (ISO 9613-2).