EPA Application Form

7.5 - Noise Emissions - Attachment

Organisation Name: *

Amazon Data Services Ireland Limited

Application I.D.: *

LA009911

* indicates required field

Amendments to this Application Form Attachment

Version No.	Date	Amendment since previous version	Reason
V.1.0	July 2017	N/A	Online application form attachment
As above	Mar 2018	Identification of required fields	Assist correct completion of attachment

Noise Emissions (see Note i at the end of this attachment)

Note: An assessment of the impacts of noise, where applicable, should be uploaded in Tab 7 – 'Emissions Overview' of the application form.

Provide detail of measures to reduce noise emissions (list techniques)
(See Note ii at the end of this attachment)

In relation to Building A each noise source was input as sound power in octave bands. The sound power of each source was measured in accordance with *BS4196:1991: Determination of sound power levels using sound pressure*. This standard involves the measurement of sound pressure at a set of points on an enveloping surface around the source, and applying a correction to the measured level to obtain the sound power of the source. Predictor accepts sound power levels in octave bands from 63Hz to 8kHz. Table 1 details the A-Weighted sound power levels and associated spectra for the various noise sources associated with the ventilation plant on site. In terms of the noise model this bank of nine AHU plant have been reproduced in order to represent the full development of the site considering 81 units in total.

Source	Height (m)	L_{wA} - Octave Band Centre Frequency							
		63	125	250	500	1k	2k	4k	8k
Intake 01	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 02	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 03	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 04	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 05	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 06	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 07	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 08	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Intake 09	3	62.8	71.9	82.3	84.3	83.5	82	75.1	66.7
Exha N 01	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 02	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 03	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 04	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 05	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 06	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 07	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 08	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4
Exha N 09	6.5	60.6	77	82.7	86.2	85.6	83.5	76.9	68.4

* indicates required field

Exha S 01	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 02	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 03	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 04	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 05	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 06	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 07	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 08	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9
Exha S 09	6.5	61.6	75.6	80.6	85.5	84.8	83.1	76.5	67.9

Table 1 L_{wA} levels Utilised in Noise Model – Building A

Acoustic louvres have been installed on intake and exhaust of the AHU plant installed on site. Table 2 outlines the required minimum sound reduction index values, as offered by the double bank louvres.

Louvre	Sound Reduction Index (SRI) dB – Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Double	7	8	11	20	29	31	29	26

Table 2 Sound Reduction Index Associated with Louvres – Building A

Noise source data for additional plant associated with Building A extension consists of some 19 additional roof mounted fans and other supporting items of plant.

Table 3 presents the noise data associated with these plant items. During the detailed design process plant items will be designed in order to achieve these guidelines or suitable levels such that the adopted noise criterion is achieved. Note it is assumed that 7 out of 10 units are operational at any one time and applies a correction for directivity associated with the vertical exhaust on roof fans. It is also assumed fans will be operating at 70% duty.

Source	No. Units	L_{wA} - Octave Band Centre Frequency								dB (A)
		63	125	250	500	1k	2k	4k	8k	
Roof Fans (16m^3/s)	12	60	64	72	75	74	71	62	59	80
Roof Fans (33m^3/s)	7	60	64	72	75	74	71	62	59	80

Table 3 L_{wA} levels Utilised in Noise Model – Building A Extension

Table 4 details the A-Weighted sound power levels and associated spectra for the various noise sources associated with the ventilation plant on site in relation to the Building B building. In terms of the noise model this bank of 55 roof mounted plant has been considered. During the detailed

design process plant items will be designed in order to achieve these guidelines or suitable levels such that the adopted noise criterion is achieved. If required appropriate acoustic louvres will be incorporated into the design of the units. Note it is assumed that 7 out of 10 units are operational at any one time and applies a correction for directivity associated with the vertical exhaust on roof fans. It is also assumed fans will be operating at 70% duty. This is considered a conservative assumption in terms of day to day operations.

Source	No. Units	L_{wA} - Octave Band Centre Frequency								dB (A)
		63	125	250	500	1k	2k	4k	8k	
Roof Fan	55	60	64	72	75	74	71	62	59	80
110 kV Substation	2	56	59	61	80	72	60	53	55	81

Table 4 L_{wA} levels Utilised in Noise Model – Building B

In terms of emergency generators the following source noise data has been assumed for the proposed units based on measurements obtained on site for generator units associated with the Building A facility.

Source	No. Units	L_{wA} - Octave Band Centre Frequency								dB (A)
		63	125	250	500	1k	2k	4k	8k	
Exhaust	20	62.2	72.1	75.8	81.4	78.6	74.6	68.0	53.0	84.8
Intake	20	74.4	86.6	89.2	90.0	85.0	79.9	74.9	61.0	94.4
Stack	20	65.0	74.4	82.2	87.2	85.2	82.3	77.3	65.2	91.0

Table 5 L_{wA} levels Utilised in Noise Model – Generators – Building A & B

Table 6 details the A-Weighted sound power levels and associated spectra for the various noise sources associated with the ventilation plant on site in relation to Building C. In terms of the noise model this bank of 50 roof mounted plant have considered. During the detailed design process plant items will be designed in order to achieve these guidelines or suitable levels such that the adopted noise criterion is achieved. If required appropriate acoustic louvres will be incorporated into the design of the units. Note it is assumed that 7 out of 10 units are operational at any one time and applies a correction for directivity associated with the vertical exhaust on roof fans. It is also assumed fans will be operating at 70% duty. This is considered a conservative assumption in terms of day to day operations.

Table 6 outlines additional attenuation incorporated into the design in relation to the roof top fan exhausts.

Source	No. Units	L_{wA} - Octave Band Centre Frequency								dB (A)
		63	125	250	500	1k	2k	4k	8k	
Roof Fan Exhaust	50	58	64	73	81	79	76	72	62	85
AHU Intake	22	43	60	70	71	66	62	51	39	75

Table 5 L_{wA} levels Utilised in Noise Model – Building C

Item	Sound Reduction Index (SRI) dB – Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
Roof Fan Attenuation	2	5	7	10	10	10	10	10

Table 6 Sound Reduction to be Applied to Proposed Roof Fans – Building C

In terms of emergency generators the following source noise data has been assumed for the proposed units based on measurements obtained on site for generator units associated with the other facilities.

Source	No. Units	L_{wA} - Octave Band Centre Frequency								dB (A)
		63	125	250	500	1k	2k	4k	8k	
Front	9	96.6	90.4	95.7	89.8	87.1	89.0	82.9	77.0	94.5
Rear	9	94.8	88.6	93.9	88.0	85.3	87.2	81.1	75.2	92.7
Sides	9	98.3	92.1	97.4	91.5	88.8	90.7	84.6	78.7	96.3
Stack	9	83.5	76.5	76.5	72.8	69.1	73.9	70.7	71.2	79.2

Table 7 Additional L_{wA} levels Utilised in Noise Model – Generators

Following the *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (2012 as amended) complete the table below, inputting summary details of noise monitoring points (see Note iii at the end of this attachment) and proposed noise limit criteria.

Monitoring point code [1]	Easting [2]	Northing [3]	Monitoring point type [4]	Proposed Noise Limit Criteria				Proposed monitoring frequency
				Max. noise level daytime dB $L_{Ar,T}$ (30 mins)	Max. noise level evening dB $L_{Ar,T}$ (30 mins)	Max. noise level night dB $L_{eq,T}$ (15-30 mins)	How was the noise limit derived? [5]	
1	310,235	228,410	Noise Sensitive Location	55	50	45	BAT / NG4 See Section 4.3 of supporting NG4 report Ref: MS/217501/1057NR01	Annual
2	309,990	228,050		55	50	45		
3	310,160	228,080		55	50	45		
4	310,170	228,622		55	50	45		
5	309,858	228,720		55	50	45		

Note: Map(s)/drawing(s) uploaded under 'Site Plans' in Tab 3 of the application form should identify the emission and monitoring points.

Was an assessment for tonal and impulsive noise carried out? [6] (Yes/No)	Yes

1 The following convention should be observed when labelling noise monitoring points:
N1, N2,.....The monitoring locations should be identified on an accompanying site plan drawing(s) uploaded in Tab 3 – 'Site' of the application form.
2 Six Digit GPS Irish National Grid Reference of Monitoring Point
3 Six Digit GPS Irish National Grid Reference of Monitoring Point
4 Monitoring point type options: 'Boundary', 'Noise Sensitive Location' or 'Permanent Noise Monitoring'
5 Derived noise limit options: 'BAT', 'EQS', or 'Derogation'
6 Refer to section 5 of the Agency's *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (2012 as amended).

* indicates required field

If 'Yes' was tonal or impulsive noise identified to be present? (Yes/No)	No

For emissions outside the EPA Noise Guidance Note limit, see the Agency's *Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)* (2012) (available on www.epa.ie), a full evaluation of the existing abatement/treatment system must be provided. A planned programme of improvement towards meeting upgraded standards is required to be uploaded with this document. This programme should highlight specific goals and a time scale, together with options for modification, upgrading or replacement, as required, to bring the emissions within the limits as set out in the Guidance Note.

Note i This part of the application form collects data on noise emissions namely measures used to reduce noise and noise levels at a reference distance under normal operation. As noise emissions can arise from different sources on a site, the EPA usually considers the total emission from the site. Please note that emission limit values and monitoring requirements in any proposed licence shall be based on the information supplied hereunder.

Note ii Measures are usually required to reduce, minimise or prevent emissions from occurring. They may involve the application of a single technique or a combination of techniques including housing, insulation and appropriate location of equipment. List all techniques proposed/employed. Technique(s) employed must comply with BAT. Highlight additional measures required for the purposes of protecting the environment. The measures or techniques to be taken must be capable of complying with the proposed/known emission level(s).
The measures required shall be informed by the following:
1. BAT techniques
2. Stricter measures/techniques than BAT
3. BAT determined by competent authority in consultation with the applicant
4. Other measures

Note iii An individual record (i.e. row) is required for each monitoring point. A National Grid Reference (12 digit, 6E, 6N) must be given for each monitoring point. Noise emissions differ from other emissions in that they are generally limited at a reference distance from the source(s). This reference distance should be, where possible, the boundary of the installation but in certain circumstances it is a noise sensitive location outside the boundary of the installation. Noise levels along a boundary will vary due to the location and positioning of noise sources and the 'worst case' should always be selected. Sufficient points should be identified to fully describe the noise levels from the installation. For waste activities, traffic noise emissions should be taken into account especially if it. The Agency's Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) (2012) and Guidance Note on Noise assessment of Wind Turbine Operations at EPA licensed Sites (NG3)(as appropriate) should be consulted when setting proposed sound limits.