Safran Landing Systems Services UK LTD

Meteor Business Park

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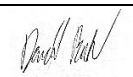
Approved By	David Fink, MIOA	Senior Consultant	

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Executive Summary

Bureau Veritas was instructed by Safran Landing Systems Services UK Ltd to undertake an environmental noise impact assessment to support the permit variation application in relation to the environmental permitting (EP) requirements for the equipment refurbishment site at Meteor Business Park, Gloucester.

It is assumed that potential vibration impacts from operation of the new plant items will be negligible at the nearest receptors, due to the separation distances, and this element would therefore be scoped out of the detailed assessment.

An assessment of the operational noise impact has been carried out in accordance with the relevant British Standard to consider the potential noise impact on the nearest noise sensitive receptors.

To establish the current levels of ambient and background sound level at the nearest residential receptors, and measurement surveys was undertaken in March 2026. Existing ambient noise levels at the nearest residential receptors are dominated by road traffic noise and helicopter and airplane noise from the adjacent site.

A computational noise model of the proposed development was assembled and populated with noise emission data of the new sound sources and measured existing sound sources. Standard noise propagation calculations were used to predict the plant operation noise levels at the nearest noise sensitive receptors.

The assessment concludes that the noise impacts of the proposed site operation would be below the Lowest Observed Adverse Effect Level. No noise mitigation measures are required.

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1. Introduction

1.1. Bureau Veritas was instructed by Safran Landing Systems Services UK Ltd to undertake an environmental noise impact assessment to support the permit variation application in relation to the environmental permitting (EP) requirements for the equipment refurbishment site at Meteor Business Park, Gloucester.

1.2. The purpose of this assessment is to provide an indication of its potential impacts on sensitive receptors off site in terms of noise, based on current guidance and best practice.

1.3. The report also details the baseline noise surveys, assessment methods used, and mitigation measures required if necessary.

1.4. A glossary of acoustic terminology is included in **Appendix One**.

2. Site Location

2.1. The site is situated in Meteor Business Park in the northeast of the town of Gloucester. The site location is easily accessible, being situated off the Road B4063. The site is near Gloucestershire Airport to the south, which is a general aviation facility located near Cheltenham, approximately 9 miles north of Gloucester city centre.

2.2. The site is situated in an industrial and commercial area, surrounded by other commercial and industrial buildings to the north, south, east and west. To further north, east and west are grasslands and vegetation. Anson Business Park is approximately 360 m to the northeast of the site.

2.3. The nearest residential properties are Cotswold Court Park off the B4063 (NSR1) to the northeast, Residential dwellings off Bamfurlong Lane to the northeast (NSR2), Fern Court off Down Hatherley Lane to the northwest, and Residential dwellings off Cheltenham Road E to the southwest. They are identified as the nearest sensitive receptors (NSRs). The locations of the NSRs are shown in **Appendix Two**.

3. Details of Development

3.1. The facility refurbishes aircraft landing gear; the process involves coating the part with protective materials such as cadmium, chrome or nickel.

3.2. For the new zinc nickel line, the associated Zn-Ni Extraction Stack is fully installed and pending commissioning.

3.3. The Zn-Ni Extraction Stack include a fume extraction system, which consists of only one 30kW centrifugal fan that will be inverter driven, along with actuated fresh air damper to balance the system when all lids are closed on the process line. There will be space allocated for the provision of a wash box/carbon filter unit installation in the future. The devices of the fume extraction system are as **Table 3.1** below.

3.4. The operation hours of the proposed new zinc nickel line are proposed to be 24/7.

3.5. The Zn-Ni extraction stack sampling general arrangement drawing and the location of the stack are shown in **Appendix Three**.

Table 3.1: Fume Extraction System			
Plant	**Model**	**Modes**	**Description**
Centrifugal Extraction Fan	CHVN900 Centrifugal fan 30kW 415V 3ph 50 Hz	OFF (Local)	Extraction fan is completely disabled
		ON (Local)	Extraction fan is enabled and running. Extraction fan uses a fixed speed set within the inverter along with a ramp up time.
Pressure Switch	24V DC	-	-
Actuated extraction damper	TBC	All lids on process line closed.	XV002 opens when all lids are closed.
		One or more lids open on the process line.	XV002 closes when one or more lids are open.
Actuated extraction damper limit switch	Kinetrol	-	-

4. Criteria for Assessment

Overview

4.1. The sounds caused by the proposed development are all considered as industrial noise, therefore British Standard 4142: 2014+A1: 2019 is the main guidance for the assessment, along with the other relevant references, to assess the potential noise impact on the nearby sensitive receptors.

4.2. It should be noted however that the BS4142 methodology does not strictly apply to HGV movements on public highways.

4.3. The relevant guidance documents are listed below:

- National Planning Policy Framework (NPPF) 2025; and the supplementary Planning Practice Guidance for Noise (PPG(N)) Dec 2014;
- British Standard 4142: 2014, "Methods for rating and assessing industrial and commercial sound" (BS4142);
- British Standard 8233: 2014, "Guidance on sound insulation and noise reduction for buildings"; and
- ISO 9613-2:1996 'Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation'

National Planning Policy Framework, 2025

4.4. The Revised NPPF (February 2025) sets out the Government's planning policies for England. It states:

"187. Planning policies and decisions should contribute to and enhance the natural and local environment by: …

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and …"

4.5. It goes on to state:

"198. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and …"

4.6. The terms 'significant adverse impact' and other adverse impacts are defined in the explanatory notes of the 'Noise Policy Statement for England (NPSE), which states:

There are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organisation. They are:

NOEL – No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life

LOAEL – Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

Extending these concepts for the purpose of this NPSE leads to the concept of a significant observed adverse effect level.

SOAEL – Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life occur.

4.7. It should be noted that specific noise limits for LOAEL and SOAEL have not yet been specifically defined, and would be specific to different sectors. However, guidance from other acoustic standards may be employed to determine suitable levels within the overall principle of the NPPF.

4.8. The Planning Practice Guidance for Noise (PPGN) provides further detail about how the effects of noise can be categorised. **Table 4.1** summarises the noise exposure hierarchy.

Table 4.1: National Planning Practice Guidance Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No specific measures required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. 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			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, 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			

Table 4.1: National Planning Practice Guidance Noise Exposure Hierarchy			
Perception	**Examples of Outcomes**	**Increasing Effect Level**	**Action**
Present and disruptive	The noise causes a material change in the behaviour, attitude or other physiological response, 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
Present and very disruptive	Extensive and regular changes in the behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

British Standard 4142: 2014+A1: 2019 'Methods for rating and assessing industrial and commercial sound'

4.9. The Standard provides a method for assessing whether a sound from industrial or commercial premises (e.g. fixed mechanical and electrical (M&E) plant, loading activities etc.) is likely to cause a disturbance to persons living in the vicinity of the site.

4.10. BS 4142 assesses potential significance of effect by comparing the 'specific sound level' of an industrial source to the typically representative background sound level (L_{A90}). Certain acoustic features can increase the potential for a sound to attract attention, and therefore increase its relative significance than that expected from a simple comparison between the specific sound level and the background sound level. In particular, BS 4142 identifies noise that contains discrete impulses and/or audible tonal qualities and in these cases recommends that a correction be added to the specific sound level. The specific sound level along with any applicable correction is referred to as the 'rating level'.

4.11. The greater the difference between the rating level and the background sound level; the greater the likelihood of complaints. The assessment criteria given by BS 4142 are as follows:

- A difference of +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of +5 dB could be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that there will be an 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 on the context.
- Also to take into account the absolute level, risk that it will cause annoyance/interference with everyday activities, context of the sound, frequency and temporal variations to the sound.

4.12. During the daytime and evening, BS 4142 requires that sound levels are assessed over 1-hour periods. During the night-time, because sleep disturbance is the important issue and individual sound events are, therefore, more important, sound levels are assessed over 15-minute periods.

British Standard 8233: 2014 Guidance on Sound Insulation and Noise Reduction for Buildings

4.13. BS 8233:2014 provides guidance for the control of noise in and around buildings. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use.

4.14. With regards to external sound sources affecting habitable residential spaces, Table 4 of BS 8233:2014 provides guideline values that it is desirable to not exceed during daytime and night-time periods. These guideline values are reproduced in **Table 4.2**.

Table 4.2: Indoor ambient sound levels for dwellings			
Activity	**Location**	**07:00 to 23:00**	**23:00 to 07:00**
Resting	Living Room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

4.15. For traditional external areas that are used for amenity space, such as gardens and patios, BS8233 states that it is desirable that the external sound level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments.

4.16. BS8233:2014 does not provide specific guidance on sound levels for regular individual sound events, such as passing trains, which can cause sleep disturbance. Guidance on suitable sound levels for individual events is provided in the WHO Guidelines for Community Noise.

4.17. The WHO guidelines state that for a reasonable standard in bedrooms to be achieved individual sound events should not normally exceed 45dB L_{Amax} 10 to 15 times during the night-time period.

4.18. As listed in Table 2 of BS8233, the design range of the indoor ambient noise levels of open plan office is 45 – 50 dB $L_{Aeq,T}$. The design range of the indoor ambient noise levels of executive office is decided as 35 – 40 dB $L_{Aeq,T}$ in Table 6 of BS8233.

4.19. As such, to do a robust assessment, the assessment criteria for the indoor ambient noise levels of office is decided as 35 dB $L_{Aeq,T}$.

ISO 9613-2:1996 'Acoustics – Attenuation of Sound during Propagation Outdoors – Part 2: General Method of Calculation'

4.20. ISO 9613-2:1996 specifies methods for the description of sound outdoors in community environments. ISO 9613 can be applied to a wide variety of sound sources and includes methods to determine most of the major mechanisms of sound attenuation, such as:

- Geometric divergence (Adiv) – spherical spreading of sound energy;
- Atmospheric absorption (Aatm) – attenuation of sound due to interaction with the air (dependant on frequency of sound and negligible at short distances);
- Ground effect (Agr) – sound reflecting by the ground surface interfacing with the sound propagating directly from source to receiver;
- Reflection from surfaces (image source method, included in Agr calculation) – sound is reflected from hard surfaces such as building facades due to atmospheric impedance of the surface. This effect increases the sound level when compared to a location free of buildings (i.e. free field); and
- Screening by obstacles (Abar) – Hard obstacles such as close-boarded timber fences and varying topography, including hills attenuate the sound from a source due to the insertion loss properties of the obstacle. However, there is an element of the sound which will diffract around the obstacle, especially at lower frequencies. The diffraction effect is determined using the path differences between the direct and diffracted sound. It should be noted that the screening effect provided by trees and foliage is negligible in the majority of cases; the exception is large areas of dense forest or plantations.

5. Baseline Sound Levels

Background sound level survey

5.1. To establish the ambient sound levels and background sound levels at the NSRs, baseline noise monitoring was carried out at four attended short-term monitoring locations ST1, ST2, ST3 and ST4 near the NSRs between Wednesday 04th March and Thursday 05th March 2026 during both daytime and night-time. The measurement locations are shown in **Appendix Two**.

5.2. The monitoring intervals are one hour during daytime and 30 minutes during night-time. The measured indices include L_{Aeq}, L_{Amax}, L_{A10} and L_{A90}.

5.3. It is noted that during the baseline noise monitoring, the new zinc nickel line and the associated Zn-Ni Extraction Stack are not in operation.

5.4. All measurements were undertaken in free-field conditions at a height of approximately 1.5 m above ground. The noise monitoring equipment was calibrated at the beginning and end of the assessment period using an acoustic calibrator, which had itself been calibrated against a reference set traceable to National and International Standards. No shift in calibration level was observed.

5.5. The noise monitoring equipment is listed in **Table 5.1** below:

Table 5.1 Noise Monitoring Equipment

Use	Make	Model	Serial Number
Noise Monitoring	Rion	NL-52 Sound Level Meter	00253699
Calibration of Sound Level Meter	Rion	NC-74 Sound Level Calibrator	821105

5.6. During the attended short-term monitoring, the meteorological conditions were slight (3-4 m/s) wind mainly from SE, clear,11°C, with 77% humidity during daytime, and slight (2-3 m/s) wind mainly from SE, clear,11°C, with 82% humidity during night-time.

5.7. The sound climate of the monitoring locations is listed as below:

- ST1 - road traffic noise and helicopter and airplane noise were dominant, along with audible birdsong during daytime; road traffic noise was predominant during night-time.
- ST2 - road traffic noise and helicopter and airplane noise helicopter and airplane noise were dominant during daytime; road traffic noise was predominant during night-time.
- ST3 - road traffic noise was dominant, along with audible helicopter and airplane noise during daytime; distant road traffic noise was dominant, along with slightly audible plant noise from the adjacent site during night-time.
- ST4 - road traffic noise was dominant, along with occasional audible helicopter and airplane noise during daytime; distant road traffic noise was dominant, along with car passing on the local road during night-time.

5.8. **Tables 5.2** presents a summary of the short-term sound level survey results.

Table 5.2: Summary of Derived Sound Levels at the Short-term Monitoring Locations

Period	Date	Monitoring Location	Time Period	Sound Pressure Level, dB re: 20µPa (Fast, Free-field)			
				$L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A90,T}$
Day	04-03-2026	ST1	12:33 – 13:33	52.9	73.3	53.9	47.9
		ST2	13:39 – 14:39	57.4	79.1	59.0	50.6
		ST3	14:49 – 15:49	53.7	74.0	54.9	46.6

Table 5.2: Summary of Derived Sound Levels at the Short-term Monitoring Locations							
Period	Date	Monitoring Location	Time Period	Sound Pressure Level, dB re: 20µPa (Fast, Free-field)			
				$L_{Aeq,T}$	$L_{Amax,T}$	$L_{A10,T}$	$L_{A90,T}$
		ST4	16:08 – 17:08	63.6	90.9	65.8	54.7
Night		ST1	23:00 – 23:30	50.1	78.5	51.2	47.2
		ST2	23:38 – 00:08	50.4	69.4	51.8	48.2
	05-03-2026	ST3	00:17 – 00:47	44.5	60.8	45.2	43.7
		ST4	00:57 – 01:27	54.4	79.0	49.7	40.0

5.9. As shown in **Table 5.1**, at quiet daytime periods, the sound levels were 48 dB $L_{A90,T}$ and 53 dB $L_{Aeq,T}$ at ST1, 51 dB $L_{A90,T}$ and 57 dB $L_{Aeq,T}$ at ST2, 47 dB $L_{A90,T}$ and 55 dB $L_{Aeq,T}$ at ST3, and 55 dB $L_{A90,T}$ and 64 dB $L_{Aeq,T}$ at ST4.

5.10. At night-time periods, the sound levels were 47 dB $L_{A90,T}$ and 50 dB $L_{Aeq,T}$ at ST1, 48 dB $L_{A90,T}$ and 50 dB $L_{Aeq,T}$ at ST2, 44 dB $L_{A90,T}$ and 45 dB $L_{Aeq,T}$ at ST3, and 40 dB $L_{A90,T}$ and 54 dB $L_{Aeq,T}$ at ST4.

5.11. In order to ensure the assessment undertaken is robust, during daytime, **48** dB L_{A90} is considered to be the representative background sound level for NSR1, **51** dB L_{A90} for NSR2, **47** dB L_{A90} for NSR3, and **55** dB L_{A90} for NSR4. During night-time, **47** dB L_{A90} is considered to be the representative background sound level for NSR1, **48** dB L_{A90} for NSR2, **44** dB L_{A90} for NSR3, and **40** dB L_{A90} for NSR4.

Sound Source Measurements

5.12. Sound source measurements were undertaken on 04th March 2026. Based on the observations of our site surveyor, the significant sound sources within the site are those outdoor, including the existing stacks for chrome extraction & nickle/cadnium plant, chiller, paint strip booth extract, and the boiler stack in front of the building.

5.13. The new zinc nickel line plant is not operational, but it was fully turned on for the sound source measurements. The outdoor noise emission of the new plant was also measured.

5.14. **Table 5.3** shows the derived sound levels when site operation activities occurred at the Site.

Table 5.3: Summary of Derived Sound Levels of Site Plants		
Plants	Distance from Sound Source	Sound Pressure Level (dBA)
2no. Existing stacks	_*	59
1no. Chiller	@1m	75
1no. Paint strip booth extract	_*	56
1no. Boiler stack	_*	59
North of the new plant	@1m	70
East of the new plant	@1m	61
South of the new plant (including the extraction fan)	@1m	75

*The measurement locations are as close as possible to the stacks, which are shown in **Appendix Four**.

5.15. It should be noted that the noise levels in **Table 5.3** are the L_{Aeq} values over duration time of 10s to 37s. The significant sound sources are steady and continuous, so each measurement was carried out in a short duration in absence of the contribution of other significant ambient sounds, e.g. frequent helicopter and airplane noise from the adjacent site. The measured data is used for the calibration of sound sources in the noise model.

5.16. An additional measurement was also carried out at a distance of approximately 17 m from the new extraction stack for calibration of the model.

5.17. The measurement locations of the sound source measurements are shown in **Appendix Four**.

6. Noise and Vibration Assessment

6.1. In order to ensure the assessment undertaken is robust, the impact assessment with respect to operational noise on the existing environment covers the following plant noise:

- Potential on-site noise from the existing plant items;
- Potential on-site noise from the new zinc nickel line plant.

6.2. The assessment of the noise impact of the site operation is based on the ambient sound levels ($L_{Aeq,T}$) and the background sound levels ($L_{A90,T}$) measured in March 2026. The sound levels of site operation at the nearest sensitive receptors are predicted by noise modelling, using CadnaA.

6.3. Noise propagation was predicted using algorithms described in ISO 9613-2, as incorporated within the noise modelling software.

6.4. Ground absorption was assumed to be 0.5 for the mixed-use land. The reflection order was set up as 2. The reflection loss of buildings is set as 1 dB (Smooth facade). The barriers and the modified topology of the proposed development are also included in the model.

6.5. Due to the typically low vibration levels that are likely to be generated, it is expected that operational activities would not result in perceptible vibration impacts on any of the sensitive receptors. Therefore, no further assessment of operational vibration was undertaken.

Identification of Sound Sources

6.6. Based on the site layout provided and site survey results, the significant operational plant sound sources are all outdoor, including:

- Existing stacks;
- Chiller;
- Paint strip booth extract;
- Boiler stack;
- New zinc nickel line plant associated with extraction stack.

6.7. During the sound source measurement, there was only one HGV entered the site. There are approximately 10 HGVs entering the site per week. Given the screening of the site buildings, long distance between the receptors and the site, and low frequency of HGV movements, the HGV movement is not considered as a significant sound source of the site.

6.8. The existing stacks, chiller, paint strip booth extract and boiler stack are modelled as point sound sources and the new plant is modelled as 3D area sound sources.

6.9. It is assumed that all plant is operating 24/7 as the worst case.

6.10. The modelled sound emission rates comprise:

- 2no. existing stacks = 102 dB L_{WA}, at 9 m height;
- 1no.chiller = 86 dB L_{WA}, at 1m height;
- 1no. paint strip booth extract = 96 L_{WA}, at 8 m height;
- 1no. boiler stack = 87 L_{WA}, at 5 m height;
- North of the new plant= 86 L_{WA}
- East of the new plant= 74 L_{WA}
- South of the new plant = 90 L_{WA}

6.11. The assumed spectrums of the sound sources are shown in **Appendix Five**, based on the measured data.

Predicted Sound levels

Existing site noise with the newly installed plant noise

6.12. The predicted specific sound levels of all the existing and new site noise at the nearest receptors are shown in **Table 6.1** below.

Table 6.1: Summary of Predicted Sound Levels of All Plant Operation on the Nearest Facades

Receptor(s)	Sound Pressure Level, dB $L_{Aeq,T}$ (highest noise levels on façade) - Daytime	Sound Pressure Level, dB $L_{Aeq,T}$ (highest noise levels on façade) – Night-time
NSR1 Cotswold Court Park	35	35
NSR2 Residential dwellings off Bamfurlong Lane	31	34
NSR3 Fern Court off Down Hatherley Lane	31	31
NSR4 Residential dwellings off Cheltenham Road E	32	34

6.13. **Figures A6.1** and **A6.2** in **Appendix Six** show the predicted sound propagation grids of the existing plants and the newly installed zinc nickel line plant during daytime and night-time at 1.5 m and 4 m, respectively.

Newly installed plant noise

6.14. The predicted specific sound levels of the new plant noise at the nearest receptors are shown in **Table 6.2** below. As indicated in **Table 6.2**, the newly installed zinc nickel line plant noise will not increase the existing site noise at the NSRs.

Table 6.2: Summary of Predicted Sound Levels of New Plant Operation on the Nearest Facades

Receptor(s)	Sound Pressure Level, dB $L_{Aeq,T}$ (highest noise levels on façade) – Daytime (changes compared with only existing site noise)	Sound Pressure Level, dB $L_{Aeq,T}$ (highest noise levels on façade) – Night-time (changes compared with only existing site noise)
NSR1_ Cotswold Court Park	16 (+0)	16 (+0)
NSR2_ Residential dwellings off Bamfurlong Lane	16 (+0)	19 (+0)
NSR3_ Fern Court off Down Hatherley Lane	8 (+0)	9 (+0)
NSR4_ Residential dwellings off Cheltenham Road E	16 (+0)	18 (+0)

6.15. **Figures A6.3** and **A6.4** in **Appendix Six** show the predicted sound propagation grids of the newly installed zinc nickel line plant during daytime and night-time at 1.5 m and 4 m, respectively.

BS4142 assessment

6.16. The indicative BS 4142 assessment for the newly installed zinc nickel line plant based on the highest noise levels on façades is provided in **Tables 6.3** and **6.4** below.

Table 6.3: Indicative BS 4142:2014 Assessment - Daytime			
Description	**Result**	**Relevant Clauses of BS 4142:2014**	**Commentary**
Specific Sound Level (free-field), dB $L_{Aeq,1hr}$	16 (NSR1) 16 (NSR2) 8 (NSR3) 16 (NSR4)	7.3.6	Predicted level (free-field) at ground floor level at the nearest receptor. Determined by calculation using CadnaA.
Background sound level, dB $L_{A90,1hr}$	48 (NSR1) 51 (NSR2) 47 (NSR3) 55 (NSR4)	8.1 and 8.2	The background noise levels (free-field) were measured at the monitoring locations close to the noise-sensitive receptors.
Acoustic features correction, dB	0	9.2	No perceptible acoustic characteristics are predicted to be audible at the residential dwellings given the high ambient noise and existing dominant traffic noise in the area.
Rating Level, dB $L_{Ar,1hr}$	16 (NSR1) 16 (NSR2) 8 (NSR3) 16 (NSR4)		
Excess of Rating Level over Background Sound Level, dB	-32 (NSR1) -35 (NSR2) -39 (NSR3) -39 (NSR4)		
Assessment of impact: Assessment indicates Low impact due to the new plant operation noise at NSRs		11	
Context		11 8.2	A sound reduction of 10-15 dB is expected through a partially open window for ventilation, therefore internal noise from the delivery would be well below the BS8233 guidelines for bedrooms and living rooms (35 dB $L_{Aeq,8h}$) at the NSRs.
Uncertainty of the assessment		10	The specific noise level has been predicted by CadnaA, which utilises ISO9613 calculations, which have a claimed uncertainty of +/- 3 dB.

6.17. The results of BS4142 assessment in **Table 6.3** indicate that, during the daytime period the predicted sound levels generated by the new plant would result in Low impacts on the residential NSRs.

Table 6.4: Indicative BS 4142:2014 Assessment – Night-time			
Description	**Result**	**Relevant Clauses of BS 4142:2014**	**Commentary**
Specific Sound Level (free-field), dB $L_{Aeq,T}$	16 (NSR1) 19 (NSR2) 9 (NSR3) 18 (NSR4)	7.3.6	Predicted level (free-field) at first floor level at the nearest receptor. Determined by calculation using CadnaA.
Background sound level, dB L_{A90}	47 (NSR1) 48 (NSR2) 44 (NSR3) 40 (NSR4)	8.1 and 8.2	The background noise levels (free-field) were measured at the monitoring location representative of the noise-sensitive receptors.
Acoustic features correction, dB	0	9.2	No perceptible acoustic characteristics are predicted to be audible within the residential dwellings given the high ambient noise and existing dominant traffic noise in the area.
Rating Level dB L_{Ar}	16 (NSR1) 19 (NSR2) 9 (NSR3) 18 (NSR4)		
Excess of Rating Level over Background Sound Level, dB	-31 (NSR1) -29 (NSR2) -35 (NSR3) -22 (NSR4)		
Assessment of impact: Assessment indicates Low impact due to new plant operation noise at NSRs		11	
Context		11 8.2	A sound reduction of 10-15 dB is expected through a partially open window for ventilation, therefore internal noise from the delivery would be well below the BS8233 guidelines for bedrooms (30 dB $L_{Aeq,8h}$) at the NSRs.
Uncertainty of the assessment		10	The specific noise level has been predicted by CadnaA, which utilises ISO9613 calculations, which have a claimed uncertainty of +/- 3 dB. The background sound levels at the receptors are decided based on the short-term noise monitoring.

6.18. The results of BS4142 assessment in **Table 6.4** indicate that, during the night-time period, the predicted sound levels generated by the new plant would result in Low impacts on the residential NSRs.

6.19. The assessment concludes that the noise impact of the new plant operation would be below the Lowest Observed Adverse Effect Level at the nearest residential receptors. As such, no noise mitigation measures are required.

Uncertainty & Context

6.20. As noted within **Tables 6.3 & 6.4**, rating levels are predicted to be well below background sound levels at all NSRs during the daytime and night-time.

6.21. Whilst this is indicative that the newly installed plant will not have an adverse impact, uncertainty and context should be considered to ensure any assessment of impact is robust.

6.22. It is considered that uncertainty within the assessment has been controlled through the following means:

- Assumption of hemispherical propagation;
- Assumption that soft ground is fully reflective (G=0.5);
- Assumption that all receptors are downwind of source (windspeed 3m/s);and
- Assumption of continuous operation during daytime and night-time periods.

6.23. It is considered that the above factors minimise the impact of any uncertainty within the assessment conclusion, as the assumptions and limitations are assumed to be worst-case.

6.24. With regard to the context of the assessment, it should be noted that the BS 4142 assessment is undertaken for external areas only, and therefore does not account for the reduction of specific noise levels to internal spaces (which is considered to be most relevant during night-time, given the importance of avoiding sleep disturbance). Assuming a reduction of 15 dB through an open window (which is considered a worst-case assumption), the specific sound levels would be below 30 dB internally.

6.25. It is therefore considered that the results of the assessment are robust, and the impacts associated with newly installed plant at the site are within the Lowest Observed Adverse Effect Level (LOAEL).

7. Conclusion

7.1. Bureau Veritas was instructed by Safran Landing Systems Services UK Ltd to undertake an environmental noise impact assessment to support the permit variation application in relation to the environmental permitting (EP) requirements for the refurbishment site at Meteor Business Park, Gloucester.

7.2. An assessment of the operational noise impact has been carried out in accordance with the relevant British Standard to consider the potential noise impact on the nearest noise sensitive receptors.

7.3. To establish the current levels of ambient and background sound level at the nearest residential receptors, and measurement surveys was undertaken in March 2026. Existing ambient noise levels at the nearest residential receptors are dominated by road traffic noise and helicopter and airplane noise from the adjacent site.

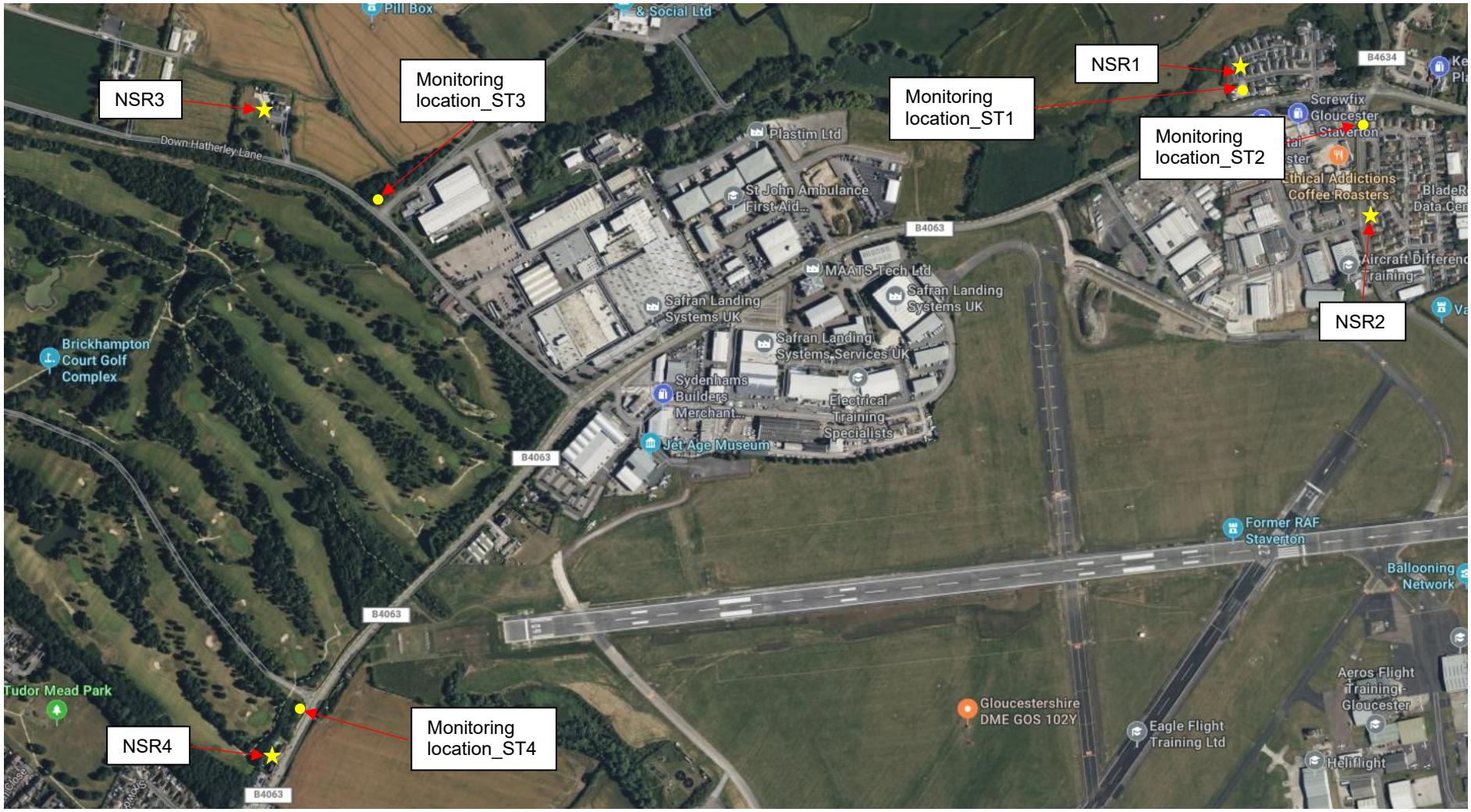
7.4. A computational noise model of the proposed development was assembled and populated with noise emission data of the new sound sources and measured existing sound sources. Standard noise propagation calculations were used to predict the plant operation noise levels at the nearest noise sensitive receptors.

7.5. The assessment concludes that the noise impacts of the proposed site operation would be below the Lowest Observed Adverse Effect Level. No noise mitigation measures are required.

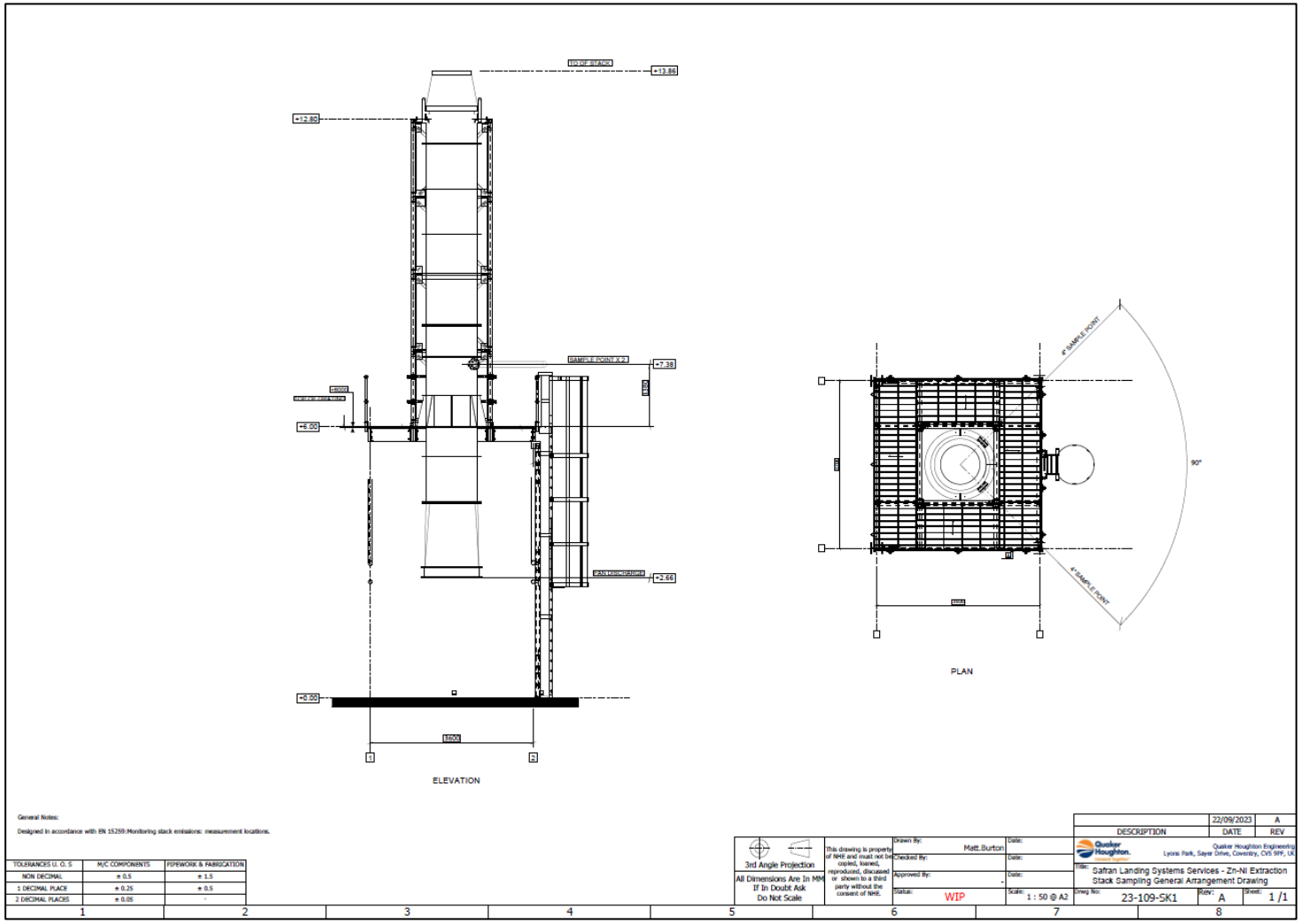
Appendix One – Glossary of Acoustic Terminology

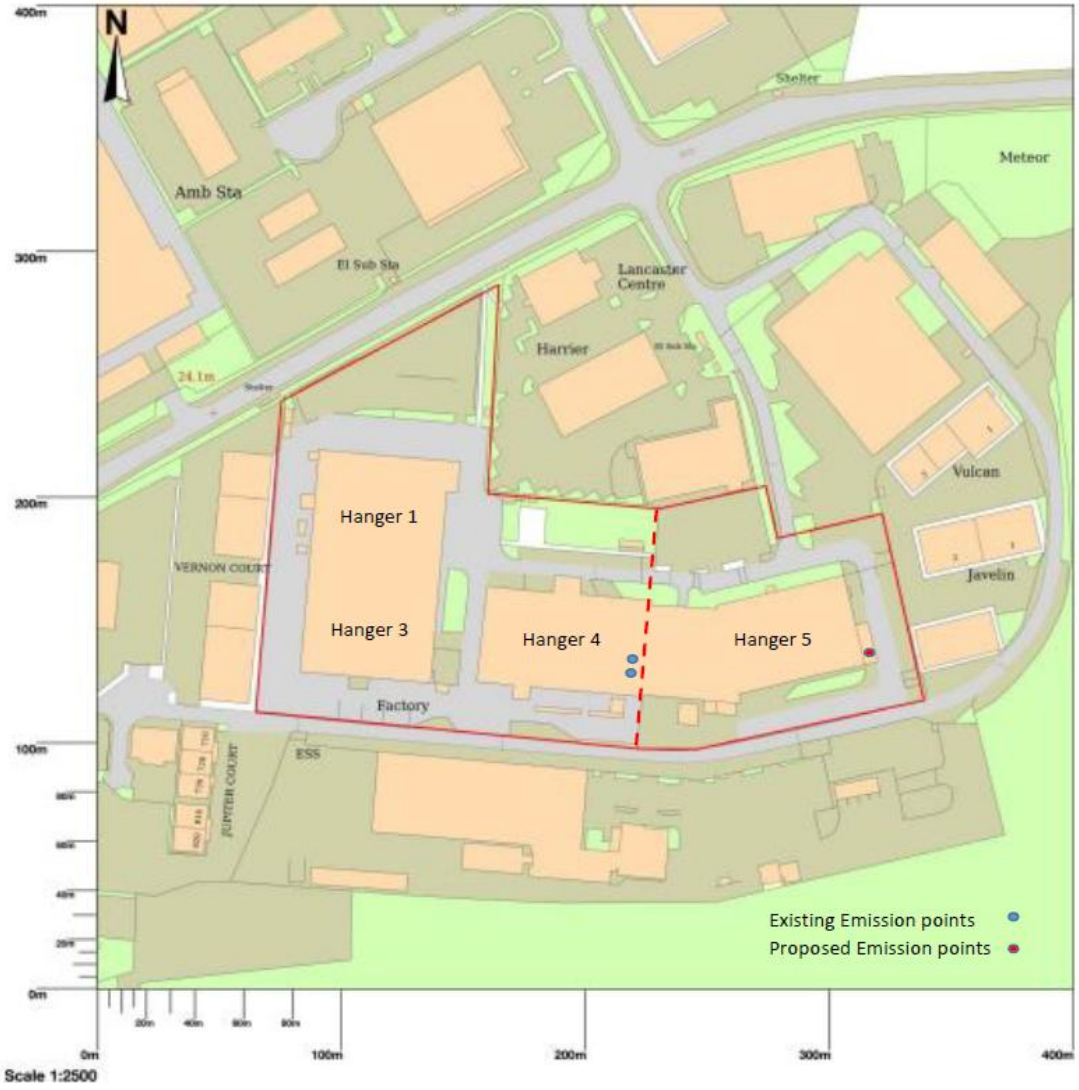
Sound power level	A logarithmic measure of the power of a sound relative to a reference value.
"A" Weighting (dB(A))	The human ear does not respond uniformly to different frequencies. "A" weighting is commonly used to simulate the frequency response of the ear. It is used in the assessment of the risk of damage to hearing due to noise.
Decibel (dB)	The range of audible sound pressures is approximately 2 x 10^{-5} Pa to 200 Pa. Using decibel notation presents this range in a more manageable form, 0 dB to 140 dB.
Ambient sound level, $L_{Aeq,T}$	equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T. NOTE The ambient sound level is a measure of the residual sound and the specific sound when present.
Background sound level, $L_{90,T}$	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.
Maximum sound level, $L_{Amax,T}$	The maximum RMS A-weighted sound pressure level occurring within a specified time period.
Noise	Unwanted sound.
Ambient sound	Totally encompassing sound in a given situation at any given time composed of noise from many sources, near and far.
Residual sound	Ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
Rating level	Specific sound level plus any adjustment for the characteristic features of the sound.

Appendix Two – NSRs and Baseline Monitoring Locations



Appendix Three – Plant Details




N
Amb Sta
El Sub Sta
Shelter
Meteor
Lancaster Centre
Harrier
24.1m
Vulcan
Javelin
Hanger 1
Hanger 3
Hanger 4
Hanger 5
VERNON COURT
Factory
ESS
JUPITER COURT
Existing Emission points
Proposed Emission points
400m
300m
200m
100m
0m
Scale 1:2500

Appendix Four – Sound Source Measurement Locations

Appendix Five – Sound Source Spectrums

Plant	Sound Power Level SWL (dBA)	Octave Band Sound Power Level SWL (dB)								
		31.5 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1k Hz	2k Hz	4k Hz	8k Hz
Existing stacks	102	108	110	109	102	100	97	91	88	82
Chiller	86	79	91	87	82	86	78	75	69	62
Paint strip booth extract	96	101	99	100	101	93	90	83	80	69
Boiler stack	87	91	89	89	86	79	77	75	83	58
North of the new plant	86	86	91	89	83	80	80	81	76	68
East of the new plant	74	82	84	83	76	72	67	64	58	52
South of the new plant (including the extraction fan)	90	91	100	95	88	88	82	67	82	82

Appendix Six – Noise Contours

Figure A6.1 Predicted noise propagation of the existing plants and the new plant during daytime – at 1.5 m high

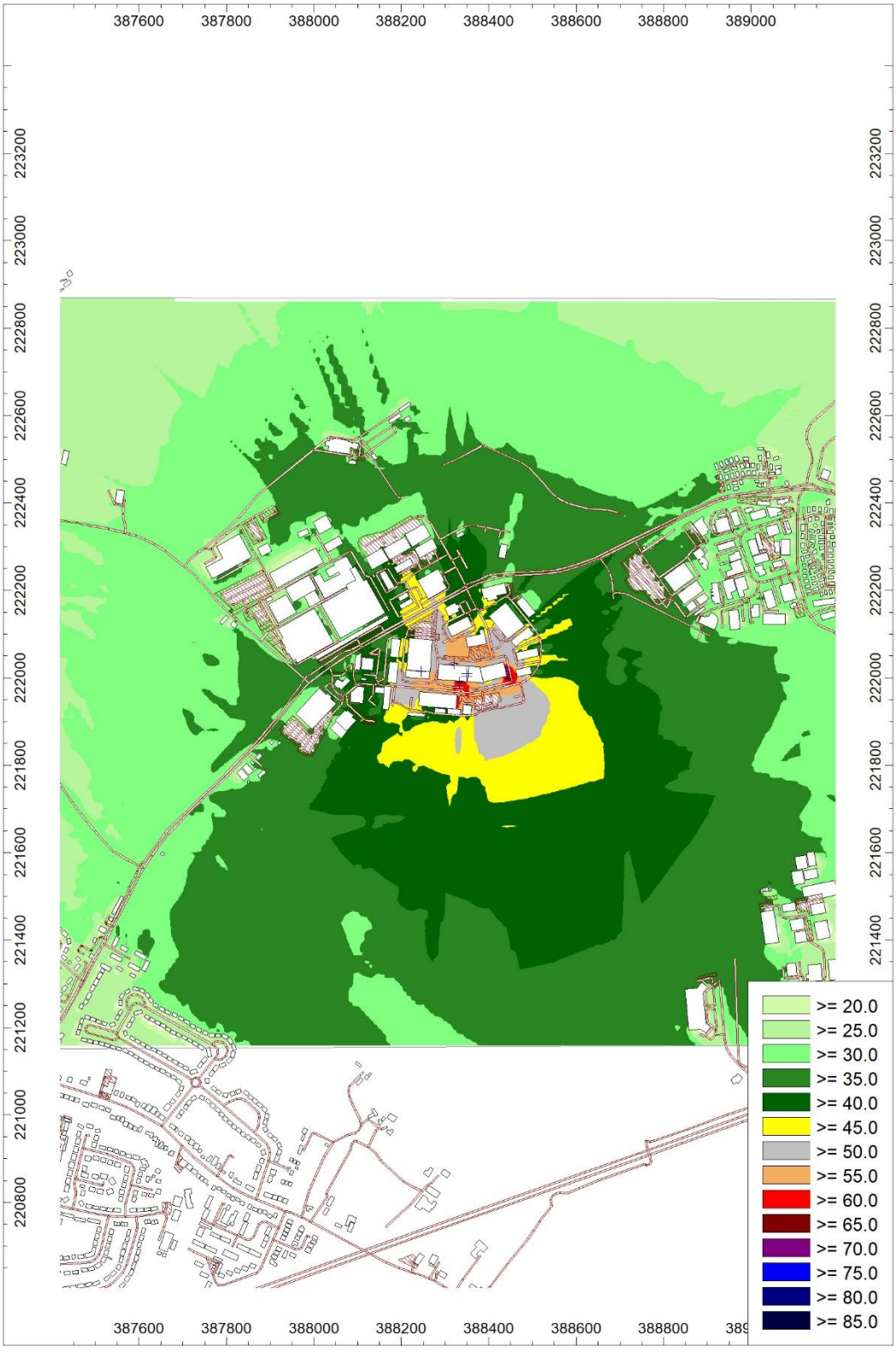


Figure A6.2 Predicted noise propagation of the existing plants and the new plant during night-time – at 4 m high

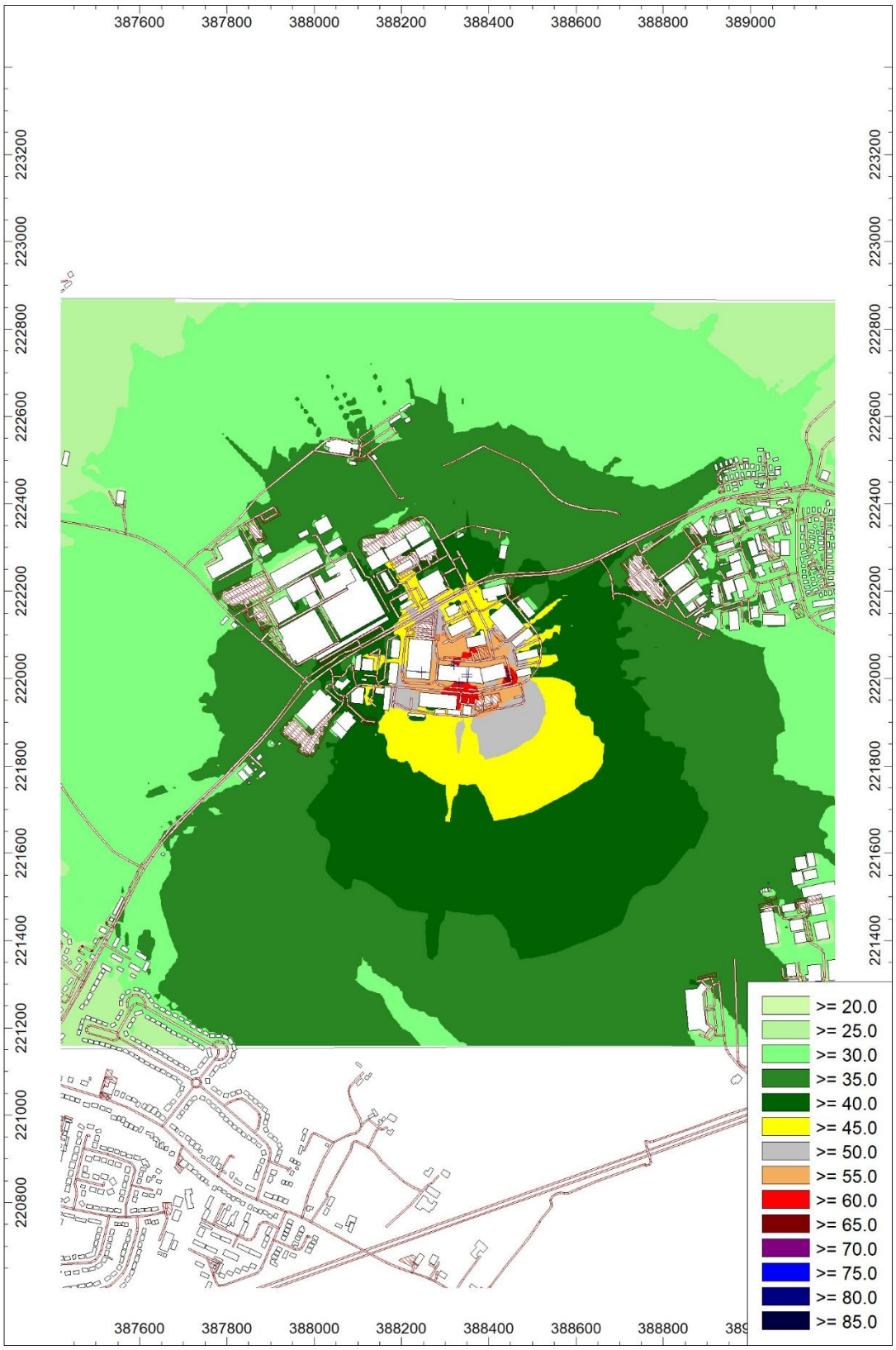


Figure A6.3 Predicted noise propagation of the new plant during daytime – at 1.5 m high

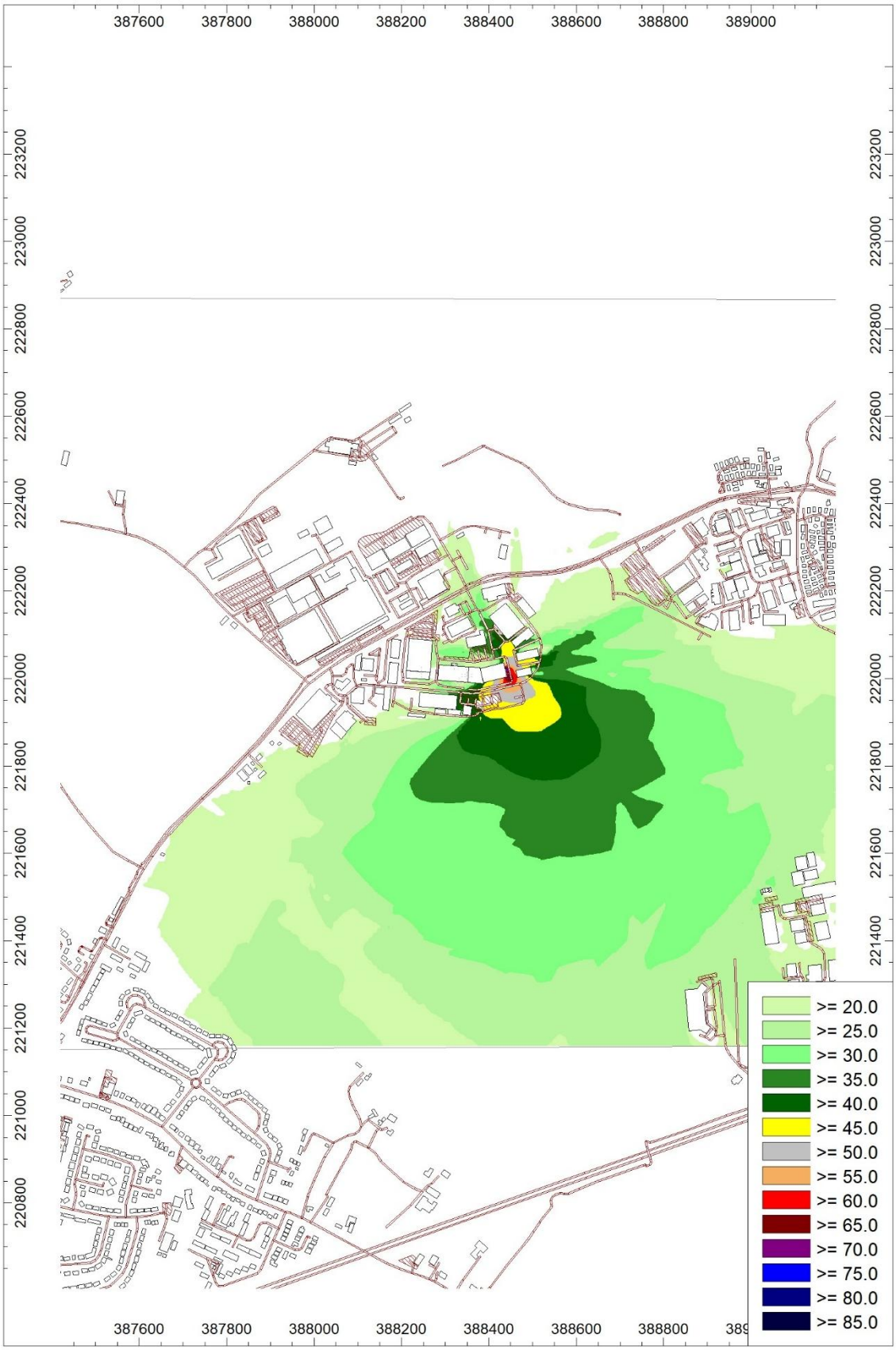


Figure A6.4 Predicted noise propagation of the new plant during daytime – at 4 m high