

NOISE IMPACT ASSESSMENT

BARLOW MOOR - GAS GOVERNER

Cadent Gas Ltd

REPORT NO. 2061821-RSKA-RP-002(01)

RSK Acoustics Limited Reg. in England and Wales No.7102436
rskacoustics.com info@rskacoustics.com +44(0)1932 829007

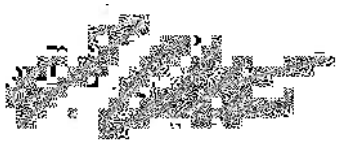
Registered Office: Spring Lodge, 172 Chester Road, Helsby, WA6 0AR
Addlestone | Bristol | Coventry | Glasgow | Helsby | Hemel | Leeds | London | Manchester



General notes

Project Name:	Barlow Moor - Gas Governer
Title:	Noise Impact Assessment
Client:	Cadent Gas Ltd
Issue Date:	02/05/2024
Report No.	2061821-RSKA-RP-002(01)

Revision:	Description:	Author:	Reviewer:	Date:
01	Issue	Thomas Dalton	Matthew White	02/05/2024

Authors:	Thomas Dalton	Technical reviewer:	Matthew White
Signature:		Signature:	
Date:	02/05/2024	Date:	02/05/2024

RSK Acoustics Ltd (RSKA) has prepared this report for the sole use of the client, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client and RSKA. No other warranty, expressed or implied, is made as to the professional advice included in this report.
Where any data supplied by the client or from other sources have been used, it has been assumed that the information is correct. No responsibility can be accepted by RSKA for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report are based on the assumption that all relevant information has been supplied by those bodies from whom it was requested.
No part of this report may be copied or duplicated without the express permission of RSKA and the party for whom it was prepared.
Where field investigations have been carried out, these have been restricted to a level of detail required to achieve the stated objectives of the work.
This work has been undertaken in accordance with the quality management system of RSK Acoustics Ltd.



Contents

1 Introduction 5
1.1 Instruction 5
1.2 Objectives 5
2 Regulatory Framework 6
2.1 National Planning Policy Framework (NPPF): 2021 6
2.2 Noise Policy Statement for England (NPSE): 2010 6
2.3 Planning Practice Guidance (PPG) 7
2.4 BS 7445-1-2-3 8
2.5 BS 4142:2014+A1:2019 9
2.6 World Health Organisation guidelines: 2000 10
3 Site Setting 11
3.1 Site Location and Description 11
4 Baseline Noise Survey 12
4.1 Survey Equipment 17
4.2 Noise Environment 13
4.3 Weather Conditions 17
5 Baseline Survey Results 18
5.1 Background Noise Levels ..... Error! Bookmark not defined.
5.2 Derivation of Criteria ..... Error! Bookmark not defined.
6 Noise Impact Assessment 20
6.1 Assessment Methodology 20
6.2 BS 4142:2014+A1:2019 Assessment 20
7 Summary 23
Glossary 24



Table 1 Summary of noise exposure hierarchy 8
Table 2 WHO guideline noise criteria 10
Table 3 Representative measurement position for each NSR 12
Table 4 Background Level Criteria 13
Table 5 Representative measurement position for each NSR 16
Table 6 Measurement Location Details 16
Table 7 Monitoring Equipment 17
Table 8 Summary of weather data during the monitoring period 17
Table 9 Noise monitoring data – Attended Montioring 19
Table 10 Noise monitoring data – MP1 2024 (Unattended Logger Position) 19
Table 11 Operational phase assessment - daytime 21
Table 12 Operational phase assessment – night 21

Figure 1 2023 Baseline monitoring and nearest ESR locations 12
Figure 2 2024 Baseline monitoring and nearest ESR locations 16

1 Introduction

1.1 Instruction

RSK Acoustics has been instructed by Cadent Gas Ltd to undertake a post-installation noise assessment of a recently installed gas governor station (GGS) at Barlow Moor Road, Chorlton-cum-Hardy, Manchester.

The recently installed GGS is located within a kiosk and has replaced the previous GGS on site in April 2024.

Due to the close proximity of residential and non-residential receptors to the GSS, a noise impact assessment (2061821-RSKA-RP-001(01) was carried out prior to installation, to determine the potential noise impact and to satisfy the planning condition 5a imposed by Manchester City Council. The results of the assessment indicated the noise would be below background at the receptors.

Condition 5b of the Planning Permission document pertains to post installation noise measurements of the proposed gas governor and is stated as follows:

"5b) Within one month of the first use of the equipment housed within the Kiosk building a verification report shall be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that acceptable criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.

Reason - To safeguard the amenities of the occupiers of the building and occupiers of nearby properties pursuant to policy DM1 of the Core Strategy and saved Unitary Development Plan DC26."

Therefore, to satisfy planning condition 5b, a noise assessment has been undertaken, including noise measurements of the recently installed GGS. The measured noise levels have been assessed against the background noise levels at the receptors.

1.2 Objectives

The objectives of the noise impact assessment are as follows;

- Measure noise levels from the GGS following installation;
- Quantify noise emissions from the GGS from each noise emitting façade of Kiosk;
- Predict noise levels from the GGS to the nearest receptors;
- Assess predicted noise emissions against background noise levels.

2 Regulatory Framework

2.1 National Planning Policy Framework (NPPF): 2021

The National Planning Policy Framework (NPPF) (published March 2012 & updated February 2021) is the means by which noise is considered within the planning regime. The NPPF does not contain assessment design target, instead providing a series of policies, giving local authorities the flexibility in meeting the needs of local communities. The NPPF states:

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

"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 impact 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."

"Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed."

2.2 Noise Policy Statement for England (NPSE): 2010

Environment, Food and Rural Affairs (Defra) and sets out the approach to noise within the Government's sustainable development strategy.

The significance of impacts from noise are defined within the NPSE as follows:

"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 due to the noise.

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."

The three aims of the NPSE are to:

"Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development."

2.3 Planning Practice Guidance (PPG)

The Department for Communities and Local Government 'Planning Practice Guidance' (PPG) expands upon the NPPF and NPSE. The guidance does not include any specific noise levels but sets out further principles that should underpin a noise assessment. The PPG states:

"Plan-making and decision making need to take account of the acoustic environment and in doing so 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."

It then refers to the NPSE and states that the aim is to identify where the overall effect of the noise exposure falls in relation to SOAEL, LOAEL and NOEL and presents a table, reproduced below. The implication of the final line of the table is that only the 'noticeable and very disruptive' outcomes are unacceptable and should be prevented. All other outcomes (i.e. all other lines in the table) can be acceptable, depending upon the specific circumstances and factors such as the practicalities of mitigation.

Response	Examples of outcomes	Increasing effect level	Action
***NOAEL** (No Observed Effect Level)*			
Not present	No effect	No observed effect	No specific measures required
***NOAEL** (No Observed Adverse Effect Level)*			
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 change in the quality of life.	No observed adverse effect	No specific measures required

Response	Examples of outcomes	Increasing effect level	Action
LOAEL (Lowest Observable 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 small actual or perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
SOAEL (Significant Observed Adverse Effect Level)			
Present and disruptive	The noise causes a material change in 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 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

Table 1 Summary of noise exposure hierarchy

2.4 BS 7445-1-2-3

The three-part British Standard, BS 7445, provides the framework within which environmental noise should be quantified. Part 1 provides a guide to quantities and procedures and Part 2 provides a guide to the acquisition of data pertinent to land use. Part 3 provides a guide to the application of noise limits.

BS 7445 also refers to a further standard, BS EN 61672, which prescribes the equipment necessary for such measurements.

Whilst BS 7445 does not prescribe the meteorological conditions under which noise measurements should or should not be taken, it does (part 2, para 5.4.3.3) recommend that in order *"…to facilitate the comparison of results (measurements of noise from different sources), it may be necessary to carry out measurements under selected meteorological conditions which are reproducible and correspond to quite stable propagation conditions."*

These conditions include:

- Wind speed not exceeding 5 m/s (measured at a height of 3 to 11 m above the ground);
- No strong temperature inversions near the ground; and
- No heavy precipitation.

2.5 BS 4142:2014+A1:2019

BS 4142:2014+A1:2019 *'Methods for rating and assessing industrial and commercial sound'* (BS 4142) describes the methods for rating and assessing noise from industrial or commercial sources, including manufacturing processes, fixed mechanical and electrical plant installations, loading/unloading of goods/materials and sound from mobile plant that is an intrinsic part of the overall sound emanating from industrial and/or commercial premises or processes.

The methods described within the standard use outdoor sound levels to assess the likely effects of sound on residential areas where sound is incident. It can be used for the purpose of investigating complaints, assessing sound from existing, proposed or modified sources of sound of an industrial and/or commercial nature, and assessing sound at proposed new dwellings or premises used for residential purposes.

The specific sound level from the industrial or commercial premises is determined through measurement of the residual sound level in absence of the specific sound and correcting for the effect of the source under assessment. In cases where the difference between the ambient and residual sound level is ≤3 dB, this can be determined through a combination of measurement and calculation.

The specific sound level is corrected for the time interval during which the specific sound is on and the specific sound is off (and therefore sound pressure is nil), and determined over a time interval which reflects significant temporal and level variations.

When the industrial and/or commercial sound source contains certain acoustically distinguishing characteristics at the receptor location which will attract attention (tonal, impulsive, intermittent), a character correction is applied to the specific sound level to give a rating level that is used to inform the assessment.

The derived rating sound level is compared against the prevailing background noise level as determined from a baseline survey. Typically, the greater this difference, the greater the magnitude of the impact, as noted below:

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- 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.

Adverse impacts may include but not be limited to annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

The methodology set out within the standard is not intended to be used to assess the extent of an impact at indoor locations. However, internal sound levels may be taken into account by considering any acoustic attenuation measures such as façade treatment or screening when discussing the context of the assessment result.



The determination of noise amounting to a nuisance is beyond the scope of the standard.

2.6 World Health Organisation guidelines: 2000

The World Health Organisation (WHO) Guidelines for Community Noise was published in 2000 as a response to a need for action together with a generic need for improvements in legislation at a national level. Although not legislation, this document provides general guidance and guidelines which have been set for different health effects, using the lowest noise level that produces an adverse health effect in specific human environments. The guideline levels which are relevant to this assessment are set out in Table 2.

Environment	Critical health effect(s)	L_{eq} dB(A)	Time base (hours)	$L_{max,F}$ dB(A)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling indoors	Speech intelligibility and moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45 [1]
Outside bedrooms	Sleep disturbance, window open (outdoor values)	45	8	60

Notes

[1] Should not exceed 45 dB L_{AFmax} more than 10-15 times per night

Table 2 WHO guideline noise criteria

3 Site Setting

3.1 Site Location and Description

The proposed gas governor is located at Barlow Moor Road, Chorlton-cum-Hardy, Manchester. The site is on the approximate National Grid Reference 382350E, 392775N.

The site plan is presented in Figure 1, showing the gas governor station location.



Figure 1 Gas Governor Station Location

The surrounding study area is predominantly residential in nature, with the exception of the Manchester Crematorium south of the site. The A536 is located to the west of the site.

4 2023 Baseline Noise Survey and Assessment (Planning Condition 5a)

To satisfy planning condition 5a, a baseline noise survey was undertaken from 12 May 2023 to 16 May 2023 to obtain ambient and background noise levels representative of the surrounding existing receptors. Full details of the baseline noise survey can be found in the report no. 2061821-RSKA-RP-002(01).

To summarise the baseline noise survey, two unattended measurement positions (MP1 and MP2) were selected as representative of the nearest receptors.

Positions were selected as being 'representative of the acoustic climate' by considering surrounding noise sources, such as the contribution from distant road traffic. As the monitoring was unattended, security and accessibility of the monitoring equipment was also considered, as well as site constraints.

Noise Sensitive Receptors, NSR1 and NSR2, were identified to be the nearest existing residential receptors to the site and therefore potentially are the most impacted by changes to the local noise environment in the area. In addition, the Manchester Crematorium offices was also considered as a receptor (NSR3) as office spaces of the Crematorium might be susceptible to noise impacts.

Table 3 below lists the chosen representative measurement location for each ESR and depicts their position in the context of the properties and application site.

Reference	Receptor Name	Representative Measurement Location
NSR1	254 Barlow Moor Road	MP1
NSR2	60 Hough End Avenue	MP1
NSR3	Manchester Crematorium	MP2

Table 3 Representative measurement position for each NSR



Figure 1 2023 Baseline monitoring and nearest ESR locations

4.1 Noise Environment during Baseline Noise Survey

No noise from the previous gas governor station was identified to be audible even at close inspection during installation and collection for the 2023 baseline noise survey.

The acoustic environment at the site, NSR1-3, was noted to be dominated by road traffic noise from Barlow Moor Road and the surrounding road network.

External plant was identified on the Manchester Crematorium northern boundary. However, this was continuous and would make up the typical noise environment. It should be noted that the plant was not audible at the monitoring locations during installation.

Other audible noise sources include birdsong, very short periods of construction noise from power tools and plant noise (not from the exiting gas governor station).

No other significant sources of noise were noted during times of attendance.

4.2 2023 Baseline Monitoring Results

Operational noise effects at the nearest noise sensitive receptors have been assessed according to BS 4142: 2014+ A1: 2019 and the guidance within NPSE (specifically to avoid significant adverse impacts on health and quality of life).

It should be noted that based upon the plant's potential operational hours of 24 hours a day, background noise levels have been established during the daytime and the night-time.

The representative background noise levels at each receptor, has been provided below in Table 4.

Ref.	Receptor Name	Baseline Measurement Location	Representative Daytime Level at Receptor	Representative Night-time Level at Receptor
NSR1	House Barlow Moor Road	MP1	38	34
NSR2	House Hough End Avenue	MP1	38	34
NSR3	Manchester Crematorium	MP2	41	34

Table 4 Background Level Criteria

4.3 2023 Assessment Summary

The results of the 2023 assessment indicate the potential noise levels associated with the GGS were predicted to be below the background noise levels. This corresponds to an indication of a low/ negligible impact, in accordance with BS 4142: 2014+ A1: 2019.

Therefore, the results of the 2023 assessment indicated the replacement gas governor station will be below the background levels and a have low/ negligible impact at the nearest receptors. Full details of the assessment can be found in 2061821-RSKA-RP-002(01).

The 2023 assessment report was submitted to the local authority, and satisfied the requirements of Planning Condition 5a.

5 2024 Post-Installation Noise Survey

5.1 Introduction

To satisfy the requirements of Planning Condition 5b, a noise survey was undertaken from the 10th till 12th April 2024, to obtain noise emissions throughout a 48-hour monitoring period to establish any changes in noise emissions through the daytime, night-time and peak demand periods.

In addition, spot measurements were carried out around the newly installed GGS, to quantify noise emissions at each façade of the GGS kiosk.

The north side of the unit comprised 5 sets of vents, the east side comprised two sets of vents with access doors, the south side comprised 5 sets of vents and the west side comprised 1 set of vents with access doors. Each set of vents comprised 1x upper vent (300mx300m grill at an approx. height of 2.5m), and 1x lower vent (300mx300m grill at an approx. height of 0.5m).

A photo of the eastern side is shown below.



Figure 1 – East side of Kiosk

5.2 Monitoring Locations

5.2.1 Unattended

It is understood that the majority of the noise generating equipment within the Kiosk is located in the eastern end, adjacent to the access doors. Therefore, the unattended monitoring location was located 3.5m from the eastern façade of Kiosk access doors, attached to the top of the perimeter fencing at a height of 3m.

5.2.2 Spot Measurements

Spot measurements were carried out at each set of vents to quantity noise levels at all facades of the kiosk and associated vents.

The spot measurements were carried out between 0912 and 0937 hours. Following a review of the time history of the unattended measurements, the L_{A90} levels during this time are consistent with the potential peak hours of gas usage, and therefore, this time period is considered suitable for to obtain representative spot measurements.

The time history of the unattended measurements is show in **Appendix A**.

5.3 Noise Environment

Noise from the existing gas governor station was clearly audible at close proximity (up to 2m), primarily coming from the vent grills. The remainder of the kiosk, including the doors when closed was observed not to leak noise from within the kiosk.

Beyond 2m, the noise from the kiosk was not clearly audible in the acoustic environment, due to noise from the A5145 and remainder of the local road network.

Maintenance works were carried out by Cadent Gas between 1030 and 1315 hours on the 11th April, and 0900 and 1000 hours on the 12th April 2024. During these maintenance works the doors of the Kiosk were open, which resulted in increased noise levels.

Other audible noise sources include birdsong, and noise from residents in gardens.

No other significant sources of noise were noted during times of attendance.

The 2024 unattended monitoring location (ML1-2024), located in the north-eastern area of the site at a height of 3m, was located with significantly less screening from A5145 than the unattended monitoring locations during the 2023 baseline noise survey. This is likely to have some impact on the difference in measured noise levels, and not a direct correlation to the contribution of the Kiosk.

5.4 Noise Environment

For the noise impact assessment, NSR1 and NSR2 were identified to be the nearest existing residential receptors to the site and therefore potentially are the most impacted by changes to the local noise environment in the area.

The Manchester Crematorium considered as a receptor (NSR3) will not be considered as a receptor within this assessment, due to the noise from the GGS not being audible beyond the southern site boundary.

Due to the GGS equipment being located in the eastern side of the Kiosk, an additional receptor at 62 Hough End Avenue has been considered within the assessed. This receptor is likely to be

exposed to noise from the northern and eastern façade, and has been included within this assessment.

Table 5 below lists the chosen representative measurement location for each ESR and depicts their position in the context of the properties and application site.

Reference	Receptor Name	Representative Measurement Location
NSR1	254 Barlow Moor Road	MP1
NSR2	60 Hough End Avenue	MP1
NSR4	62 Hough End Avenue	MP1

Table 5 Representative measurement position for each NSR



Figure 2 2024 Baseline monitoring and nearest ESR locations

For context, the geo-referenced location for the measurement position is provided in Table 6 below.

Measurement Location	Latitude	Longitude	WhatThreeWords
MP1 2024	53°25'53"N	2°16'3"W	///tiger.title.noses

Table 6 Measurement Location Details

MP1 2024 was chosen to obtain data of the any changes in noise from the GGS Kiosk, throughout the noise survey.

5.5 Survey Equipment

The noise measurements were undertaken using the following equipment:

	Equipment	Type	Serial number	Calibration date
MP1	Class 1 sound level meter	NL-52	00754130	09/11/2023
	Acoustic calibrator	NC-74	34391437	31/10/2023

Table 7 Monitoring Equipment

The sound level meters conform to the Class 1 requirements of BS EN 61672-1:2013. The calibrator used confirmed to the Class 1 requirements of BS EN IEC 60942:2018. The equipment used has a calibration history that is traceable to a certified calibration institution. Calibration certificates are available upon request. The calibration of the sound level meters was field-checked prior to commencing measurements and prior to removing the equipment from site upon completion; no significant calibration drift was observed i.e., within a +/- 0.5dB tolerance.

All spot measurements were undertaken in free field conditions with the microphone positioned at 1.5 metres above ground height to the requirements of BS 7445.

Measurements were logged in continuous 15-minute integration periods (with supplementary 100 millisecond data) and obtained using a combination of broadband indices (L_{Aeq}, L_{A10}, L_{A90} and L_{Amax}) and one-third octave frequency bands.

5.6 Weather Conditions

Weather conditions during the unattended measurement period were obtained from Weather underground (www.wunderground.com), using the weather station closest to the measuring location (with available historical data), which was judged to be at Manchester Airport weather station (IMANCH154) located approximately 7km south of the site. This weather data is summarised in Table 8.

Date	Temperature range (°C)	Total precipitation (mm)	Average wind speed (m/s)	Prevailing wind direction
10/04/2024	8-14	0.00	4	WSW
11/04/2024	12-17	0.00	4	SW
12/04/2024	10-17	0.00	4	WSW

Table 8 Summary of weather data during the monitoring period

Weather conditions are considered suitable for majority of the survey monitoring purposes in accordance with BS 7445. No significant change is noise levels was associated with changes in weather conditions.

6 2024 Noise Survey Results

A summary of the attended measurements at each set of vents around the Kiosk of the GGS has been provided as L_{A90} levels below. Due to the low levels of steady state noise, and contribution from general surrounding noise sources. It is considered appropriate to use the L_{A90} levels as representative values for the GGS.

The specific levels $L_{A90,T}$, have been provided along with the L_{90} 1/3 Octave band levels in Table 9. Values are rounded to the nearest whole number.

Monitoring Location	Ref:	Duration of measurement		Measured noise level (dB) (Hz)								
			$L_{A90,T}$	31.5	63	125	250	500	1k	2k	4k	8k
Eastern Façade Vent Set 1	AML1	00:00:20	49	55	55	48	44	42	46	41	38	34
Eastern Façade Vent Set 2	AML2	00:00:20	48	54	57	50	44	42	44	40	35	30
Northern Façade Vent Set 1	AML3	00:00:20	47	56	53	49	50	43	41	35	34	27
Northern Façade Vent Set 2	AML4	00:00:20	47	55	54	44	42	42	43	38	35	28
Northern Façade Vent Set 3	AML5	00:00:20	45	55	52	42	40	40	42	36	33	26
Northern Façade Vent Set 4	AML6	00:00:20	47	57	56	50	44	43	43	37	31	24
Northern Façade Vent Set 5	AML7	00:00:20	47	54	53	44	42	43	44	37	30	23
Western Façade Vent Set 1	AML8	00:00:20	49	56	54	45	46	46	46	38	32	24
Southern Façade Vent Set 1	AML9	00:00:20	47	54	52	44	45	43	45	36	29	21
Southern Façade Vent Set 2	AML10	00:00:20	49	57	53	45	46	46	46	38	33	25
Southern Façade Vent Set 3	AML11	00:00:20	50	56	54	45	46	47	48	40	34	27

Monitoring Location	Ref:	Duration of measurement		Measured noise level (dB) (Hz)								
			$L_{A90,T}$	31.5	63	125	250	500	1k	2k	4k	8k
Southern Façade Vent Set 4	AM12	00:00:20	50	57	57	47	47	47	47	40	36	29
Southern Façade Vent Set 5	AML13	00:00:20	50	54	53	49	46	46	47	39	30	21
Centre of Parking Area 1	AML14	00:00:20	51	55	55	49	46	46	47	40	29	20
Centre of Parking Area 2	AML15	00:00:20	50	54	53	51	45	46	47	40	25	14

Table 9 Noise monitoring data – Attended Montioring

6.1 Long Term Monitoring Locations

A summary of the levels, measured at MP1 2024 located 3m above ground level at the northeastern boundary of the Cadent Gas site is shown below in Table 10. This location was chosen to monitoring change in noise levels from the GGS Kiosk throughout the noise survey. The time history for MP1 2024 is shown in Appendix A.

Date	Time	Measured noise levels (dB)			
		$L_{Aeq,T}$	$L_{AFmax,T}$	$L_{A10,T}$	$L_{A90,T}$
Day 1 10/04/2024	10:00-23:00	52	79	50	53
	23:00-07:00	48	68	43	48
Day 2 11/04/2024	07:00-23:00	56	90	49	55
	23:00-07:00	48	67	43	48
Day 3 12/04/2024	07:00-10:00	58	93	52	57

Table 10 Noise monitoring data – MP1 2024 (Unattended Logger Position)

7 Noise Impact Assessment

7.1 Assessment Methodology

Plant noise levels derived from the attended measurements have been used to quantify noise emissions from each façade of the GGS Kiosk.

The noise levels from the GGS Kiosk facades have been predicted at the nearest existing noise sensitive receptors. The assessment has considered distance losses, and corrections for reflections, directivity. The assessment has assumed no screening, due to the upper vents being located at approx. 2.5m in height. This is considered a robust worst-case assumption.

As previously mentioned, attended measurements were carried out between 0912 and 0937 hours. Following a review of the time history of the unattended measurements, the L_{A90} levels during this time are consistent with the potential peak hours of gas usage, and therefore, this time period is considered suitable for to obtain representative spot measurements.

Noise predictions have been based on the noise data presented in Table 9 for the proposed gas governor. Noise measurements from each set of vents was calculated to determine a sound power L_{wA} for each of the kiosks façade, taking into consideration the dimensions of each façade.

The noise predictions comprise cumulative contributions from sound power levels L_{wA} of the nearest facades of the kiosk facing the main amenity areas of the garden.

It is suggested that noise emissions from the Gas Governor Kiosk levels should not exceed the background levels at the receptors in order to be considered a 'Low Impact' in accordance with BS4142.

7.2 BS 4142:2014+A1:2019 Assessment

Based on the methodology above, the specific levels predicted at the nearest noise sensitive receptors are compared against the 2023 baseline ambient sound level to determine the noise impact from the proposed plant, in accordance with the guidelines of BS 4142.

The 1/3 octave band data predicted at the receptors has been assessed in accordance with 'Objective method for assessing the audibility of tones in sound: One-third octave method' detailed in Annex C of BS 4142: 2014+ A1: 2019. The results indicate that there would be no tones audible at the receptors. Therefore, no penalty for tonality has been applied.

No other acoustic characteristics are likely to be perceptible at the receptors, due to the continuous steady state nature of the low-level noise from the GGS. No characteristic penalties will therefore be applied to the specific level.

Table 11 and Table 12 present the operational phase assessment of the predicted plant noise emissions for the daytime and night-time periods respectively.

Results	Noise sensitive receptor location		
	NSR1	NSR2	NSR4
Predicted specific sound level, $L_{Aeq,1hr}$ (dB)	29	27	30
Existing background sound level, $L_{A90,1hr}$ (dB)	38	38	38
Character corrections	0	0	0
Predicted rating sound level, $L_{Ar,1hr}$ (dB)	29	27	30
Existing lowest ambient sound level, $L_{Aeq,1hr}$ (dB)	42	42	42
Excess of rating over background level (dB)	**-9**	**-11**	**-8**

Table 11 Operational phase assessment - daytime

Results	Noise sensitive receptor location		
	NSR1	NSR2	NSR3
Predicted specific sound level, $L_{Aeq,15min}$ (dB)	29	27	30
Existing background sound level, $L_{A90,15min}$ (dB)	34	34	34
Character corrections	0	0	0
Predicted rating sound level, $L_{Ar,15min}$ (dB)	29	27	30
Existing lowest ambient sound level, $L_{Aeq,15min}$ (dB)	34	34	38
Excess of rating over background level (dB)	**-5**	**-7**	**-4**

Table 12 Operational phase assessment – night

Based on the above results in Table 11 and 12, there is a clear indication that with the rating level will be significantly below the background noise level is an indication of a low/ negligible impact.

Therefore, the results of this assessment indicate the recently installed gas governor station will likely have little to no impact at the nearest receptors and therefore, will not be considered further.

8 Summary

RSK Acoustics has been instructed by Cadent Gas Ltd to undertake a post installation noise monitoring assessment of a replacement gas governor station (GGS) at Barlow Moor Road, Chorlton-cum-Hardy, Manchester.

The noise assessment has determined the noise levels emitting from the GGS Kiosk using measured spectral data at the source and has been predicted noise levels to the receptors. The predicted levels have been assessed against background levels for the nearest receptors in line with BS4142.

The results of the assessment indicate the gas governor station noise is below background levels during the daytime and night-time at receptors, and therefore noise emissions will have a low/ negligible impact in accordance with BS4142.

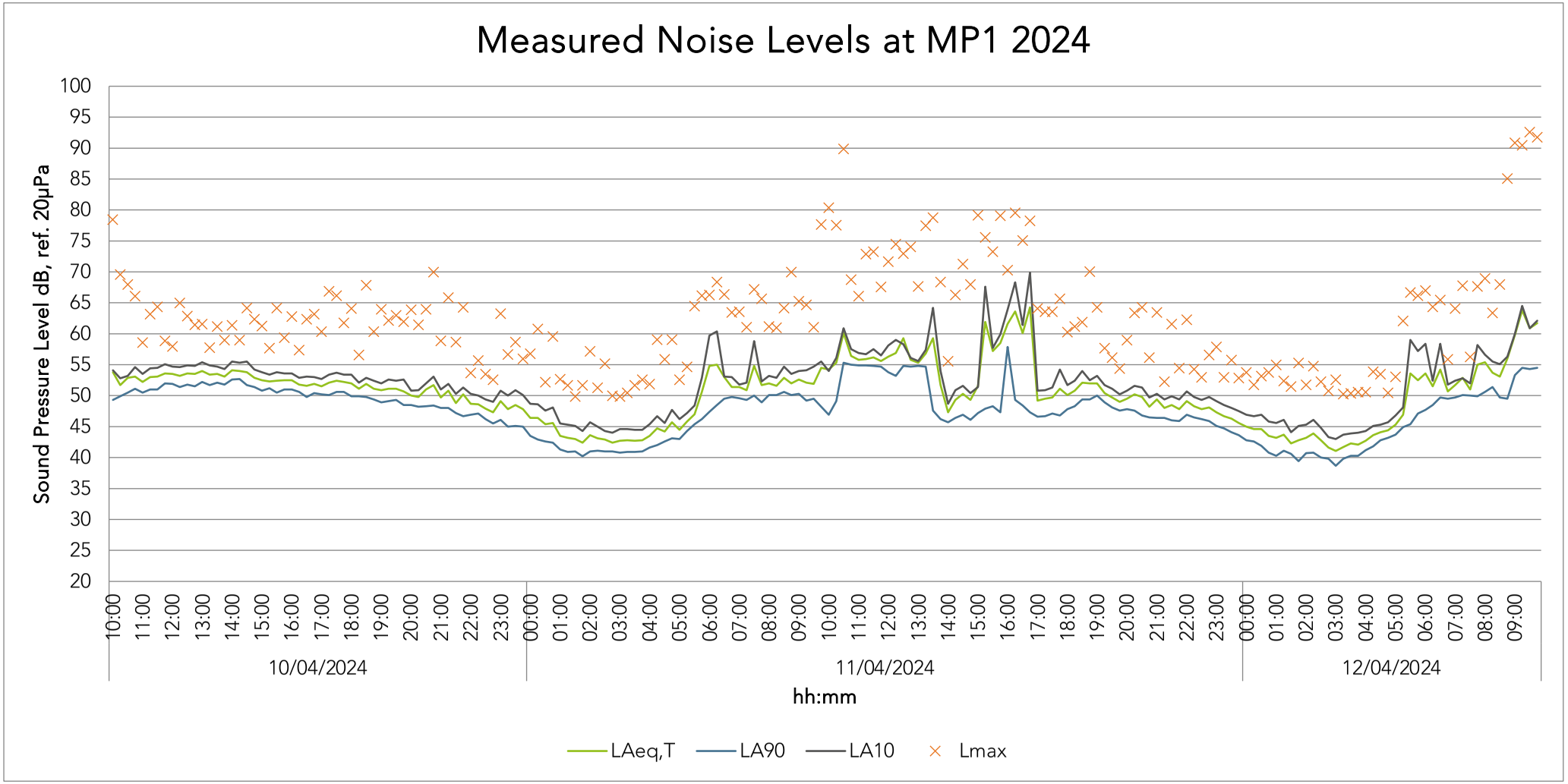
Therefore, the requirements of the planning condition 5b have been achieved.

Glossary

Term	Definition
Ambient sound	The total sound at a given place, usually a composite of sounds from many sources near and far.
Background sound, $L_{A90,T}$	A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval.
dB	Decibel. Scale for expressing sound pressure level. It is defined as 20 times the logarithm of the ratio between the root mean square pressure of the sound field and a reference pressure i.e. $2x10^{-5}$ Pascal.
dB(A)	A-weighted decibel. This provides a measure of the overall level of sound across the audible spectrum with a frequency weighting to compensate for the varying sensitivity of the human ear to sound at different frequencies. Example sound levels include: 140 dB(A) Threshold of pain 120 dB(A) Threshold of feeling 100 dB(A) Loud nightclub 80 dB(A) Traffic at busy roadside 60 dB(A) Normal speech level at 1m 40 dB(A) Quiet office 20 dB(A) Broadcasting studio 0 dB(A) Median hearing threshold (1000 Hz)
Frequency	The repetition rate of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the Hertz (Hz), which is identical to cycles per second. A thousand hertz is often denoted as kHz, e.g. 2 kHz = 2000 Hz. Human hearing ranges approximately from 20 Hz to 20kHz.
$L_{Aeq,T}$	This is defined as the notional steady sound level over a stated period of time (T), would contain the same amount of acoustical energy as the A-weighted fluctuating sound measured over that period.
NR	Noise rating. A set of curves based on the sensitivity of the human ear. They are used to give a single-figure rating for a range of frequencies.
Rating level	Specific sound level of a source plus any adjustment for the characteristic features of the sound.
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.
Sound absorption	Process whereby sound energy is converted in to heat. Sound absorption properties is expressed as the sound absorption coefficient α or the sound absorption class (A-E).
Sound insulation	The reduction or attenuation of airborne sound by a solid element between source and receiver.
Specific sound	Sound pressure level produced by the source being assessed at the assessment location.



Appendix A – MP1 2024 Time History



RSK acoustics

