

Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area - Environmental Statement Volume 2 Chapter 11: Noise and Vibration

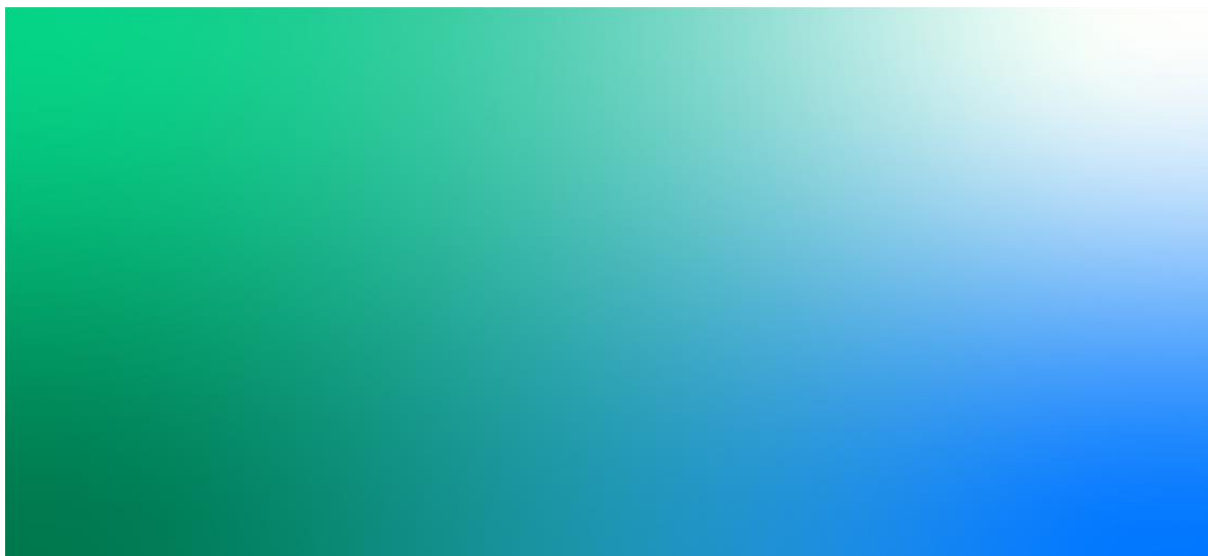
United Utilities Water Limited

Haweswater Aqueduct Resilience Programme

Planning Application Document RVBC-P&R-APP-RP-002 / ES-CH-11
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Water for the North West



Alternative Temporary Park and Ride and Heavy Goods Vehicle Marshalling Area - Environmental Statement Volume 2 Chapter 11: Noise and Vibration

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11. Noise and Vibration

11.1 Overview and Scope of the Assessment

- 1) This chapter details the likely significant effects of the Alternative Facility in relation to noise and vibration. The assessment considers the following matters:
 - Noise and vibration arising from additional road traffic
 - Noise and vibration arising from plant and machinery.
- 2) This chapter has links to the assessment presented in other topic chapters, in particular Chapter 7 Ecology, which assesses the likely significant effects on ecological receptors and Chapter 8 Cultural Heritage, which considers effects on historic receptors such as Listed Buildings.
- 3) This chapter is supported by the following figure and appendices:
 - Figure 11.1 Noise and Vibration Sample Receptor Locations
 - Appendix G Noise and Vibration Supplementary Information.
- 4) A list of abbreviations and acronyms is presented in Volume 4 Appendix A.1.
- 5) The activities that would take place at the Alternative Facility are divided into construction, operation and decommissioning phases. The operational phase of the site would be part of the wider construction phase of the HARP scheme and, as such, has been assessed against the construction criteria set out in this chapter.

11.1.1 Scope of the Assessment

- 6) The following matters have been scoped out of the assessment, as these are unlikely to result in significant effects given the offset distance between the nearest noise and vibration sensitive receptors and the Alternative Facility:
 - Construction vibration due to traffic on temporary haul roads: No vibration-sensitive receptors have been identified within the study area for construction vibration impacts due to traffic movements on temporary haul roads (4 m)
 - Vibration due to traffic on public roads: Design Manual for Roads and Bridges (DMRB) LA 111¹ states that vibration resulting from vehicle movements on maintained road surfaces (free of irregularities and under general maintenance) will not have the potential to lead to significant adverse effect.
- 7) Table 11.1 presents the scope of the assessment for noise and vibration.

¹ Highways England (2020). Design Manual for Roads and Bridges, LA 111 Noise and vibration. Revision 2. [Online]. Available at: <https://www.standardsforhighways.co.uk/search/cc8cfcf7-c235-4052-8d32-d5398796b364> [Accessed: February 2025].

Table 11.1: Matters Scoped In to the Assessment

Receptor/ Receptor Group	Matter/Likely Significant Effects	Comments
Construction (and Decommissioning) Phase		
Noise-sensitive receptors	Noise from vehicle movements and plant within the planning application boundary	Although no noise-sensitive receptors have been identified within the 300 m study area (see Section 11.3), a precautionary approach has been adopted and an assessment of potential noise effects has been undertaken.
	Noise from the Alternative Facility traffic on Pimlico Link Road and other nearby affected roads	An assessment of the potential noise effects associated with construction traffic movements has been undertaken.
New House	Vibration from construction activities undertaken in vicinity of New House	The derelict/unoccupied New House property is located within approximately 5 m of the planning application boundary. An assessment of potential structural impacts due to construction vibration activities has been undertaken. No other buildings have been identified within the vibration study area (see Section 11.3), and as such construction vibration has been considered at New House only.
Operational Phase		
Noise-sensitive receptors	Noise from the Alternative Facility traffic on Pimlico Link Road and other nearby affected roads, and noise from within the Alternative Facility	An assessment of the potential noise effects associated with operational traffic movements has been undertaken.

11.2 Key Legislation, Policy and Guidance

8) Table 11.2 sets out key legislation, policy and guidance of relevance for noise and vibration.

Table 11.2: Key Legislation and Guidance for Noise and Vibration

Applicable Legislation and Guidance	Description
Legislation	
Control of Pollution Act 1974 ²	Defines the powers of local authorities to control construction noise by restricting construction methods, plant and working hours.
Environmental Protection Act 1990 Part III ³	Requires control of pollution, including noise, arising from industrial, commercial or other activities; restates the law defining statutory nuisances and improves the summary procedures for dealing with them.

² Control of Pollution Act 1974. [Online]. Available at: <https://www.legislation.gov.uk/ukpga/1974/40/contents> [Accessed: February 2025].

³ Environmental Protection Act 1990. [Online]. Available at: <https://www.legislation.gov.uk/ukpga/1990/43/contents> [Accessed: February 2025].

Applicable Legislation and Guidance	Description
National Policy	
National Planning Policy Framework (NPPF) ⁴	Paragraph 187 states that planning decisions should contribute to and enhance the natural and local environment by (among other things) preventing new and existing development from contributing to, being at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution. Paragraph 198 states that planning decisions should also: ▪ 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 ▪ Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.
Noise Policy Statement for England ⁵	Provides explanation of the term 'significant adverse impact' from the NPPF. The document also defines the meanings of the terms, Lowest Observed Adverse Effect Level (LOAEL), Significant Observed Adverse Effect Level (SOAEL), and No Observed Effect Level (NOEL).
Planning Practice Guidance ⁶ – Noise	This provides guidance on the implementation of the NPPF for Noise and Vibration, including how the planning system can manage potential noise impacts in new developments and also makes reference to the use of LOAEL and SOAEL in determining noise impacts.
Local Policy	
Ribble Valley Borough Council Core Strategy ⁷	Nuisance caused by noise is only specifically mentioned in relation to Policy DME5: Renewable Energy. DMG1: General Considerations states that developments must not adversely affect the amenities of the surrounding area.
Guidance	
British Standard (BS) 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise ⁸	Part 1 of this British Standard provides a method for assessing and predicting noise from construction sites at nearby sensitive receptors. The standard also includes noise control guidance and presents a library of construction plant noise emission data.

⁴ Ministry of Housing, Communities and Local Government (2024). National Planning Policy Framework. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> [Accessed: January 2025].

⁵ Department for Environment, Food and Rural Affairs (Defra) (2010). Noise Policy Statement for England. Available at: <https://www.gov.uk/government/publications/noise-policy-statement-for-england> [Accessed: November 2024].

⁶ Ministry of Housing, Communities and Local Government (2019). Planning Practice Guidance – Noise. Available at: <https://www.gov.uk/guidance/noise--2> [Accessed: November 2024].

⁷ Ribble Valley Borough Council (2014). Core Strategy 2008 – 2028: A Local Plan for Ribble Valley. Available at: <https://www.ribblevalley.gov.uk/downloads/file/2331/adopted-ribble-valley-core-strategy-december-2014> [Accessed: November 2024].

⁸ British Standards Institution (2014a). BS 5228-1:2009 +A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise. [Online] Available at: <https://knowledge.bsigroup.com/products/code-of-practice-for-noise-and-vibration-control-on-construction-and-open-sites-noise?version=standard> [Accessed: January 2025].

Applicable Legislation and Guidance	Description
BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration ⁹	Part 2 of this British Standard provides guidance related to the assessment and prediction of vibration at nearby sensitive receptors due to activities at construction sites. The standard also includes guidance on the control and measurement of vibration.
Design Manual for Roads and Bridges (DMRB) LA 111 Noise and Vibration ¹⁰	Provides an assessment approach for noise from vehicles on existing highways and was also used to inform the construction noise and vibration assessment approach.

11.3 Study Area

- 9) Separate study areas are defined below for each element of the noise and vibration assessment.
- Construction noise: the study area was defined 300 m from the planning application boundary, based on BS 5228-1 and DMRB LA 111
 - Construction traffic noise: the study area was defined as 50 m from the carriageway edge of public roads with the potential for an increase in basic noise level (BNL) of 3 dB(A) or more. The procedure for calculating a BNL is set out in Calculation of Road Traffic Noise¹¹ and relates to a noise level at a reference location 10 m from the carriageway edge
 - Construction vibration: the study area is 100 m from the planning application boundary, based on DMRB LA 111
 - Construction traffic vibration (temporary haul roads): the study area is defined as 4 m from the carriageway edge of any unmaintained temporary route (e.g. haul route) used by heavy goods vehicles (HGV) based on guidance¹² which indicates that a 'Heavy lorry on a poor road surface' would result in groundborne vibration levels of approximately 0.3 mm/s at a distance of approximately 4 m.

⁹ British Standards Institution (2014b). BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration. [Online] Available at: <https://knowledge.bsigroup.com/products/code-of-practice-for-noise-and-vibration-control-on-construction-and-open-sites-vibration?version=standard> [Accessed: January 2025].

¹⁰ Highways England (2020). *Op. cit.*

¹¹ Department of Transport and the Welsh Office (1988). Calculation of Road Traffic Noise. London: Her Majesty's Stationery Office.

¹² New, B. M. (1986). Ground vibration caused by civil engineering works. Research Report 53. Crowthorne, Berkshire: Transport and Road Research Laboratory, Highways and Structures Department, Ground Engineering Division.

11.4 Baseline Environment

- 10) Online noise mapping data have been used to determine indicative existing baseline noise levels (arising from road and rail noise sources). Round 4 strategic noise mapping datasets for England were published in late October 2024¹³, and include Pimlico Link Road, A671 and A59. A review of the Round 4 noise mapping has been undertaken and is summarised below at receptor locations around the Alternative Facility:
- Clitheroe Community Hospital (southern/eastern façades):
 - 50 to <60 dB LAeq16hr (and Lday¹⁴)
 - 45 to <55 dB Lnight¹⁵
 - Park House, Chatburn Road, Clitheroe (southern façade):
 - 55 to <60 dB LAeq16hr (and Lday)
 - 45 to <50 dB Lnight
 - Club Farm, West Lane, Worston (northern façade):
 - 60 to <65 dB LAeq16hr (and Lday)
 - 50 to <55 dB Lnight
 - The Meadows, south of Worston (northern façade):
 - 55 to <60 dB LAeq16hr (and Lday)
 - 45 to <50 dB Lnight
 - The Bobbin Mill, Upbrooks, Clitheroe (eastern façade):
 - 40 to <45 dB LAeq16hr (and Lday)
 - <35 dB Lnight.
- 11) The Clitheroe Community Hospital is subject to a lower construction noise assessment threshold than residential receptors (see Section 11.5.2.3). As such, a review of potential ambient noise levels at the hospital has been undertaken. The baseline noise level at the eastern and southern facades of Clitheroe Community Hospital, due to road traffic on Pimlico Link Road, has been calculated using the traffic data prepared as part of Chapter 10 Traffic and Movement. Baseline noise levels at the southern and eastern facades of the hospital are predicted to be between approximately 51 and 62 dB Lday (see Appendix G Noise and Vibration Supplementary Information). This closely aligns with the predicted LAeq,16hr (and Lday) levels presented in the Round 4 strategic noise mapping.

¹³ Defra (2023). Road Noise – All Metrics – England Round 4. Retrieved from Defra Data Services Platform. [Online] Available at: <https://environment.data.gov.uk/dataset/562c9d56-7c2d-4d42-83bb-578d6e97a517> [Accessed: 25 November 2024].

¹⁴ Lday: This represents the average noise level during the daytime, typically measured from 07:00 to 19:00. It reflects the general noise exposure during the hours when most activities occur (defined in the Environmental Noise Directive (2002/49/EC)).

¹⁵ Lnight: This indicates the average noise level during the night, generally measured from 23:00 to 07:00. This metric is crucial for assessing potential sleep disturbances caused by noise (defined in the Environmental Noise Directive (2002/49/EC)).

11.5 Methodology

- 12) This section provides the criteria used in the assessment. Further details related to the prediction of construction noise are presented in Appendix G Noise and Vibration Supplementary Information.

11.5.1 Assigning Sensitivity

- 13) Both DMRB LA 111 and the IEMA Guidelines for Environmental Noise Impact Assessment¹⁶ note that receptors may have various sensitivities to noise, but do not specifically define a sensitivity scale.
- 14) Many of the guidance documents cited in Table 11.2 present different assessment criteria for different receptor types. The sensitivity of receptors has therefore been considered when selecting the assessment criteria used to describe the magnitude of impact. As such, it is not necessary to define a separate sensitivity scale for noise and vibration sensitive receptors.
- 15) The noise and vibration sensitive receptors included in Table 11.3 have been assessed. These sensitive receptors represent those closest to the Alternative Facility. The receptor locations are presented in Figure 11.1 Noise and Vibration Sample Receptor Locations.

Table 11.3: Noise and Vibration Sensitive Receptors

Receptor ID	Receptor Name
R1	Clitheroe Community Hospital
R2	Park House, Chatburn Road, Clitheroe
R3	Club Farm, West Lane, Worston
R4	The Meadows, south of Worston
R5	The Bobbin Mill and Upbrook Farm, Upbrooks, Clitheroe
R6	New House (derelict/unoccupied property south of Clitheroe, at Alternative Facility western boundary)

11.5.2 Assigning Magnitude and Significance of Effect

- 16) The Noise Policy Statement for England¹⁷ introduced the concept of LOAEL and SOAEL values for noise. The Noise Policy Statement for England describes a LOAEL as the level above which adverse effects on health and quality of life can be detected, while a SOAEL is the level above which significant adverse effects on health and quality of life occur. The NSPE also defines the NOEL, which is the level below which no effect can be detected.

11.5.2.1 Construction Airborne Noise

- 17) The impact magnitude scale for construction airborne noise is presented in Table 11.4. Table 11.5 reproduces the example thresholds for a potential significant effect at residential receptors presented in Table E.1 of BS 5228-1. The values in Table 11.5 have been adopted as the SOAEL values for the assessment of construction noise at residential properties. The construction noise LOAEL would be considered to be the baseline noise level (dB LAeq,T) at the noise-sensitive receptor.

¹⁶ IEMA (2014). Guidelines for Environmental Noise Impact Assessment. Version 1.2. Lincoln: IEMA.

¹⁷ Defra (2010). *Op. cit.*

Table 11.4: Magnitude of Impact – Construction Airborne Noise

Magnitude of Impact	Construction Noise Level
Major	Above or equal to SOAEL +5 dB(A)
Moderate	Above or equal to SOAEL and below SOAEL +5 dB(A)
Minor	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

Table 11.5: Threshold for Potential Significant Construction Airborne Noise Impact at Residential Properties (SOAEL)

Reference Period	SOAEL Threshold Value dB LAeq,T (Façade)		
	Category A ⁽¹⁾	Category B ⁽²⁾	Category C ⁽³⁾
Weekday daytime (07:00-19:00) Saturdays (07:00-13:00)	65	70	75
Weekday evenings (19:00-23:00) Saturdays (13:00-23:00) Sundays (07:00-23:00)	55	60	65
Night-time (23:00-07:00)	45	50	55

NOTES

(1) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

(2) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

(3) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

Note: A potential significant effect is indicated if the LAeq,T noise level arising from the Alternative Facility exceeds the threshold level for the category appropriate to the ambient noise level.

11.5.2.2 Construction Road Traffic Noise

- 18) The noise impact magnitude scale for construction road traffic, and the LOAEL and SOAEL values for residential properties, are set out in Table 11.6. The onset of a potential significant effect from road traffic noise, subject to change in road traffic noise, may occur at or above the LOAEL.

Table 11.6: Magnitude of Impact and LOAEL and SOAEL Values for Construction Road Traffic Noise

Magnitude of Impact	Change in Predicted Noise Level Resulting from Construction Traffic Noise		
	Where Predicted Noise Level is Less Than LOAEL of 55 dB LA10,18hr Façade (Equivalent to 53 dB LAeq,T)	Where Predicted Noise Level is Between LOAEL and SOAEL	Where Predicted Noise Level is More Than SOAEL of 68 dB LA10,18hr Façade (Equivalent to 66 dB LAeq,T)
Major	-	Greater than or equal to 5.0 dB	Greater than or equal to 5.0 dB
Moderate	-	Greater than or equal to 5.0 and less than 10.0 dB	Greater than or equal to 3.0 and less than 5.0 dB
Minor	-	Greater than or equal to 3.0 and less than 5.0 dB	Greater than or equal to 1.0 and less than 3.0 dB
Negligible	Any	Less than 3.0 dB	Less than 1.0 dB

11.5.2.3 Construction Noise – General

- 19) The magnitude scale, and LOAEL and SOAEL methodology set out above (Sections 11.5.2.1 and 11.5.2.2) are applicable to residential receptors.
- 20) The daytime SOAEL assessment threshold for hospitals is 50 dB LAeq,T^{18,19} or a change of >3 dB, while the night-time SOAEL is 45 dB LAeq,T²⁰ or a change of >3 dB.
- 21) For the assessment of all construction noise from the Alternative Facility, and based on guidance contained within DMRB LA 111 and BS 5228-1, a significant effect would be identified where it is determined that a major or moderate magnitude of impact would occur for a duration of either:
- 10 or more days or nights in any 15 consecutive days or nights
 - A total number of days exceeding 40 in any six consecutive months.
- 22) The assessment shall assume all works would occur for a duration of at least that presented above, unless otherwise stated.

11.5.2.4 Construction Vibration

- 23) Vibration levels at New House have been assessed based upon guidance presented in BS 5228-2, which states that '*the probability of damage tends towards zero at 12.5mm/s peak component particle velocity*'²¹.
- 24) Based on BS 5228-2 and the professional experience of the assessment team, the criteria set out below in Table 11.7 have been adopted.

¹⁸ Department of Health (2013). Health Technical Memorandum 08-01: Acoustics. [Online] Available at: <https://www.england.nhs.uk/publication/health-sector-buildings-acoustic-design-requirements-hm-08-01/> [Accessed: January 2025].

¹⁹ British Standards Institution (2014c). BS 8233:2014 Guidance on sound insulation and noise reduction for buildings. [Online] Available at: <https://knowledge.bsigroup.com/products/guidance-on-sound-insulation-and-noise-reduction-for-buildings?version=standard> [Accessed: January 2025].

²⁰ BS 8233:2014 and World Health Organisation Guidelines – Equivalent external level assuming 15 dB reduction for a partially open window.

²¹ British Standards Institution (2014b). *Op. cit.*

Table 11.7: Construction Vibration Impact Criteria to Prevent Cosmetic Damage to Buildings

Category of Building	Peak Particle Velocity (PPV) ²² mm/s – at Building Foundation	
	Transient Vibration ⁽¹⁾	Continuous Vibration ⁽²⁾
Potentially vulnerable buildings ⁽³⁾	6	3
Structurally sound buildings	12	6

NOTES

Thresholds are based on those used for HS2 vibration impact criteria for buildings. Taken from High Speed 2²³

(1) Transient vibration relative to building response such as impulsive vibration from percussive piling.

(2) Continuous vibration relative to building response such as vibrating rollers.

(3) BS 7385-2²⁴ highlights that the criteria for aged buildings may need to be lower if the buildings are structurally unsound. The standard also notes that criteria should not be set lower simply because a building is important or historic (listed). Properties shall be considered structurally sound, unless stated otherwise.

11.6 Assessment of Likely Significant Effects

11.6.1.1 Introduction

- 25) The assessment has been undertaken on the assumption that embedded and good practice measures would be carried out to provide a conservative basis for the assessment.

11.6.1.2 Construction

11.6.1.2.1 Construction Airborne Noise

- 26) Table 11.8 presents the predicted maximum daily construction airborne noise levels at the façades of receptors R1 to R5 for each month of the anticipated construction phase programme (including potential concurrent works activities each month). Further details regarding predicted noise levels for individual construction activities (C1 to C12) and the indicative construction phase programme are presented in Appendix G Noise and Vibration Supplementary Information.

²² Peak Particle Velocity: A measure of the maximum absolute value of unweighted ground vibration over a period of time and expressed in millimetres per second (mm/s).

²³ Department for Transport (2013). HS2 London – West Midlands Environmental Statement, Volume 5, Technical Appendices. Methodology, assumptions and assessment (route-wide). Sound, noise and vibration. [Online] Available at: <https://www.gov.uk/government/publications/hs2-phase-one-environmental-statement-volume-5-sound-noise-and-vibration/hs2-phase-one-environmental-statement-volume-5-sound-noise-and-vibration> [Accessed: January 2025].

²⁴ British Standards Institution (1993). BS 7385-2:1993 Evaluation and measurement for vibration in buildings – Part 2: Guide to damage levels from groundborne vibration. [Online] Available at: <https://knowledge.bsigroup.com/products/evaluation-and-measurement-for-vibration-in-buildings-guide-to-damage-levels-from-groundborne-vibration?version=standard> [Accessed: January 2025].

Table 11.8: Predicted Airborne Noise (Construction Phase)

Receptor	Predicted Maximum Daily Construction Noise Level (Façade dB LAeq,T)									
	SOAEL	Jan/Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
R1	50	37	46	48	47	43	44	42	41	35
R2	65	37	45	47	46	44	44	43	41	36
R3	65	40	49	51	50	45	46	43	43	38
R4	65	45	53	55	55	52	52	50	50	45
R5	65	47	57	59	57	54	52	51	51	45

NOTES

Activities: C1 Enabling works, C2 Highway modification, C3 Fencing, C4 Topsoil strip, C5 SDAA construction, C6 Outfall construction, C7 Car park construction, C8 Lighting and drainage construction, C9 White lining, C10 Generator, C11 Lighting columns, C12 Security barrier and cabin.

Programme: Jan/Feb – C1 and C3; Mar – C1, C4 and C5; Apr – C2, C4, C5, C6, C7 and C8; May – C2, C4, C7 and C8; Jun – C2, C7 and C8; Jul – C2, C7, C11 and C12; Aug – C2 and C7; Sep – C7; Oct – C9 and C10 (see Appendix G Noise and Vibration Supplementary Information).

Shading denotes predicted construction noise level is below the weekday daytime or Saturday morning SOAEL. Impact magnitude either negligible or minor.

- 27) The predicted construction phase noise levels are all below the SOAEL values presented earlier for the hours of construction (weekday daytime (07:00-19:00) and Saturday morning (07:00-13:00)). Negligible to minor adverse impacts are predicted at the closest noise-sensitive receptors and significant airborne noise effects during construction of the Alternative Facility are not anticipated.

11.6.1.2.2 Road Traffic Noise on Public Highways

- 28) Table 11.9 presents the predicted change in noise emission from Pimlico Link Road and nearby affected roads, due to the construction of the Alternative Facility. For the reasons set out within Chapter 10 Traffic and Movement (namely the magnitude of impacts identified on the wider highway network are expected to remain consistent with those set out in the consented schemes), an assessment of road traffic noise on the wider road network has not been undertaken.

Table 11.9: Predicted Road Traffic Noise (Construction Phase)

Road Name	Link ID, as used in Chapter 10 Traffic and Movement	Predicted Basic Noise Level (BNL) LA10,18hr @10m from Carriageway Edge		
		A) Baseline BNL in Construction Assessment Year 2026 ⁽¹⁾	B) Baseline and Construction Traffic BNL in Construction Assessment Year 2026 ⁽²⁾	C) Change in BNL Resulting From Construction Traffic Noise ⁽³⁾
A671 Chatburn Road, between Clitheroe centre and A671 roundabout (at hospital)	56	66.5 dB	66.5 dB	0.0 dB
A671 (Pimlico Link Road), between A59 and Alternative Facility access	57a	67.8 dB	68.0 dB	0.2 dB

Road Name	Link ID, as used in Chapter 10 Traffic and Movement	Predicted Basic Noise Level (BNL) LA10,18hr @10m from Carriageway Edge		
		A) Baseline BNL in Construction Assessment Year 2026 ⁽¹⁾	B) Baseline and Construction Traffic BNL in Construction Assessment Year 2026 ⁽²⁾	C) Change in BNL Resulting From Construction Traffic Noise ⁽³⁾
A671 (Pimlico Link Road), between Alternative Facility access and A671 roundabout (at hospital)	57b	67.8 dB	67.8 dB	0.0 dB
A59 (North-east of Pimlico Link Road)	120	72.7 dB	72.7 dB	0.0 dB
West Bradford Road South of Ribblesdale Cement Works	125	66.1 dB	66.1 dB	0.0 dB
West Bradford Road North of Ribblesdale Cement Works	126	63.1 dB	63.1 dB	0.0 dB
A59 (East of Clitheroe) (South-west Section)	149	73.9 dB	74.1 dB	0.2 dB
Chatburn Road/Clitheroe Road	150	63.3 dB	63.3 dB	0.0 dB

NOTES

The forecast traffic flows, speeds and HGV % used for the BNL noise assessment are based on those presented in the Traffic and Movement assessment

(1) Traffic data do not include any HARP related road traffic (including that generated by the Alternative Facility)

(2) Traffic data include HARP-related road traffic (including that generated by the Alternative Facility)

(3) Change in BNL due to HARP-related road traffic (A – B = C)

Shading denotes predicted BNL change is <1.0, resulting in a negligible impact magnitude.

- 29) The predicted BNL change in the 2026 construction phase is less than +1.0 dB for each of the road links representing existing roads in the vicinity of the Alternative Facility. As such, the impact magnitude at noise-sensitive properties due to construction road traffic on existing roads is anticipated to be negligible.
- 30) The closest noise-sensitive receptors to the access road are approximately 500 m away. At this distance a noise level of 43 dB LAeq,T is predicted at the façade of the receptors and would therefore remain below the LOAEL (53 dB LAeq,T). As such, the impact magnitude at noise-sensitive properties due to construction road traffic on the access road is anticipated to be negligible.

11.6.1.2.3 Construction Vibration

- 31) Vibratory compaction is anticipated to be undertaken during the construction phase of the Alternative Facility and has been identified as the activity most likely to give rise to high vibration levels at New House (R6), the only receptor identified within the study area for construction vibration. New House is approximately 5 m from the Alternative Facility. Should soil compaction be required at the perimeter of the planning application boundary then vibration levels may exceed the threshold values presented in Section 11.5 (see Appendix G Noise and Vibration Supplementary Information for predicted vibration levels for vibratory compaction, from distances between 10 to 100 m). However, typical methods to control vibration impacts during compaction are included in Appendix A.2 Construction Code of Practice and would be adopted by the construction contractor. With the adoption of these

measures, such as running start up and run down modes away from sensitive properties and adopting low vibration amplitude or non-vibratory techniques when working in close proximity to New House, it is anticipated that vibration impacts can be controlled, and significant effects are not predicted.

- 32) In addition to vibration during vibratory compaction works, construction vibration due to construction vehicle movements has also been assessed using the guidance presented by the Transport and Road Research Laboratory²⁵, which indicates that a 'Heavy lorry on a poor surface' would result in groundborne vibration levels (PPV) of less than 1 mm/s at a distance of approximately 2 m. Based on this, the position of New House at approximately 5 m from the planning application boundary, and the assessment thresholds presented earlier, the risk of potential cosmetic damage is considered low.

11.6.1.3 Operation

11.6.1.3.1 Operational Airborne Noise

- 33) Table 11.10 presents the predicted operational phase airborne noise levels at the façades of receptors R1 to R5. The operational phase would commence after the construction phase is completed (anticipated to be late 2026), and the Alternative Facility would remain operational for approximately seven years. Appendix G Noise and Vibration Supplementary Information presents technical assumptions used for the prediction of airborne noise during the operational phase.

Table 11.10: Predicted Airborne Noise (Operational Phase)

Activity/Noise Source	Operating Time	Predicted Maximum Daily Construction Noise Level (Façade dB LAeq,T)					SOAEL R2-R5, (R1)
		R1 ⁽¹⁾	R2	R3	R4	R5	
Op1) Generator and HVAC systems	Day and night	19	20	21	25	25	45 (45) ⁽²⁾
Op2) Cars arriving for first shift change	Mon-Sat 06:00-07:00	20	20	22	26	26	45 (45)
Op3) Maximum hourly car, bus and HGV movements ⁽³⁾	Mon-Fri, 07:00-19:00 and Sat 08:00-13:00	32	32	34	39	41	65 (50)
Op4) Maximum hourly car and bus movements ⁽³⁾	Mon-Fri 19:00-20:00 and Sat 13:00-14:00	23	24	26	30	30	55 (50)

NOTES

Shading denotes predicted operational phase noise level is below the applicable SOAEL value. Impact magnitude either negligible or minor.

(1) SOAEL for R1 Clitheroe Community Hospital is 50 dB LAeq,T daytime; and 45 dB LAeq,T night-time

(2) Night-time SOAEL values for R1-R5

(3) Maximum hourly vehicle movements (i.e. car, bus and HGV) may not occur within the same 1-hour period, but for the purpose of creating a precautionary assessment approach, are assumed to do so.

- 34) The predicted operational phase noise levels are all below the relevant SOAEL values at receptors R1 to R5. As such, only negligible to minor adverse impacts are anticipated at the

²⁵ New, B. M. (1986). *Op. cit.*

closest noise-sensitive receptors, and therefore significant airborne noise effects due to operational phase activities at the Alternative Facility are not anticipated.

11.6.1.3.2 Road Traffic Noise on Public Highways

- 35) Table 11.11 presents the predicted change in noise emission from Pimlico Link Road and other nearby roads affected by the Alternative Facility. For the reasons set out within Chapter 10 Traffic and Movement (namely, that the magnitude of impacts identified on the wider highway network is expected to remain consistent with those set out in the consented schemes), an assessment of road traffic noise on the wider road network has not been undertaken.

Table 11.11: Predicted Road Traffic Noise (Operational Phase)

Road Name	Link ID, as used in Chapter 10 Traffic and Movement	Predicted Basic Noise Level (BNL) LA10,18hr @10m from Carriageway Edge		
		A) Baseline BNL in Operational Assessment Year 2028 ⁽¹⁾	B) Baseline and Operational Traffic BNL in Operational Assessment Year 2028 ⁽²⁾	C) Change in BNL Resulting From Construction Traffic Noise ⁽³⁾
A671 Chatburn Road, between Clitheroe centre and A671 roundabout (at hospital)	56	66.6 dB	66.6 dB	0.0 dB
A671 (Pimlico Link Road), between A59 and Alternative Facility access	57a	67.7 dB	68.0 dB	0.3 dB
A671 (Pimlico Link Road), between Alternative Facility access and A671 roundabout (at hospital)	57b	67.7 dB	67.8 dB	0.3 dB
A59 (North-east of Pimlico Link Road)	120	72.7 dB	72.8 dB	0.1 dB
West Bradford Road South of Ribblesdale Cement Works	125	66.2 dB	66.7 dB	0.5 dB
West Bradford Road North of Ribblesdale Cement Works	126	63.2 dB	63.8 dB	0.6 dB
A59 (East of Clitheroe) (South-west Section)	149	74.0 dB	74.0 dB	0.0 dB
Chatburn Road/Clitheroe Road	150	63.4 dB	63.4 dB	0.0 dB

NOTES

The forecast traffic flows, speeds and HGV% used for the BNL noise assessment were produced as part of the Traffic and Movement assessment

(1) Traffic data do not include any HARP-related road traffic (including that generated by the Alternative Facility)

(2) Traffic data include HARP-related road traffic (including that generated by the Alternative Facility)

(3) Change in BNL due to HARP-related road traffic (A – B = C)

Shading denotes predicted BNL change is ≤3.0, resulting in a negligible or minor impact magnitude.

- 36) The BNL change in the 2028 operational phase is less than +1.0 dB for each of the road links representing existing roads in the vicinity of the Alternative Facility. As such, the impact magnitude at noise-sensitive properties due to road traffic on existing roads is anticipated to be negligible.

11.6.1.4 Decommissioning

- 37) Noise impacts (and vibration impacts at R6 New House) arising during the decommissioning phase of the Alternative Facility are anticipated to be broadly comparable to those during the construction phase. However, additional noise and vibration may arise during activities associated with removing elements of the Alternative Facility, which may, for example, require the use of concrete breaking and crushing plant and equipment.
- 38) Table 11.12 presents the predicted maximum daily decommissioning noise level at the façades of receptors R1 to R5.

Table 11.12: Predicted Airborne Noise Level (Decommissioning Phase)

Construction Activity	Predicted Maximum Daily Decommissioning Noise Level (Façade dB LAeq,T)				
	R1	R2	R3	R4	R5
D1) Decommissioning, demolition	43	43	45	53	55
SOAEL	50	65	65	65	65
Predicted noise level vs. SOAEL	-7	-22	-20	-12	-10
NOTES Shading denotes predicted construction noise level is below the weekday daytime or Saturday morning SOAEL. Impact magnitude either negligible or minor.					

- 39) The predicted demolition works noise level is below the SOAEL values presented earlier for the hours of construction (weekday daytime (07:00-19:00) and Saturday morning (07:00-13:00)). Negligible to minor adverse impacts are predicted at the closest noise-sensitive receptors, and significant airborne noise effects during demolition works at the Alternative Facility are not anticipated.
- 40) Based on the assessment of potential effects during the construction phase of the Alternative Facility (as presented in Table 11.8), and the predicted noise levels in Table 11.12, no significant effects for noise and vibration are anticipated during the decommissioning phase.
- 41) Potential combined noise effects during demolition works with other decommissioning activities, such as the activities presented in Table 11.8, which are considered to be representative of those to be undertaken during decommissioning, are not presented. This is due to a provisional decommissioning phase programme of works not being available at the time of assessment. However, based on the conservative construction phase noise predictions presented earlier, no significant effects resulting from potential combined working are anticipated.

11.6.2 Proposed Mitigation

- 42) The proposed mitigation is split into 'Noise and Vibration Monitoring', included in Appendix A.2 Construction Code of Practice, and 'Noise and Vibration Management – Specific Provisions', which are presented below.

11.6.2.1 Noise and Vibration Management – Specific Provisions

- 43) Soil storage is required on site due to the requirement for a temporary soil strip. This would be achieved through the establishment of four soil storage mounds at points around the perimeter of the Alternative Facility (as shown in Figure 3.1). These soil storage areas, although required primarily to store topsoil and subsoil, would have the additional beneficial effect of attenuating some of the construction phase and decommissioning phase noise. There are few

such benefits to be gained during the operational phase. The soil storages are not required as specific mitigation measures to achieve desirable noise levels. Their size and location within the Alternative Facility have the coincidental benefit of mitigating noise, rather than acting as specific mitigation requirements.

- 44) The storages would be constructed to a height above ground of approximately 2 m. At this height, and based on the storage positions presented in Figure 3.1, the storages are predicted to provide up to 1 to 2 dB of noise mitigation during the construction and decommissioning phases of the Alternative Facility. Noise reductions from these storages during the operational phase are predicted to be less than 1 dB. It should be noted that the level of noise mitigation would be influenced by noise source heights, amongst other variables, and the values presented above are indicative only.
- 45) Solid plywood panel hoarding is located along the length of the northern boundary of the Alternative Facility. The solid plywood panel hoarding is included in the design to reduce noise due to the Alternative Facility at the derelict/unoccupied New House building, in which it is understood that barn owls have been observed, and within trees to the north of Alternative Facility, where barn owls and bats have been observed. As stated earlier, this chapter has not considered noise impacts at New House. Please see Chapter 7 Ecology for further information regarding this receptor and the solid plywood panel hoarding along the northern boundary.
- 46) A review of the solid plywood panel hoarding in the noise model demonstrates that the noise mitigation afforded by the hoarding at the nearest receptors considered in this chapter is negligible.

11.6.3 Summary of Residual Effects

- 47) A summary of residual effects for noise and vibration, following the application of mitigation, is set out below in Table 11.13.

Table 11.13: Summary of Significant Effects for Noise and Vibration

Receptor	Description	Comment	Significance of Effect
Noise-sensitive receptors	Noise from vehicle movements and plant within the planning application boundary during construction and decommissioning phases	Short-term, negligible to minor adverse impacts may occur (predicted noise levels <SOAEL values). No significant adverse effects are anticipated.	Not significant
	Noise from the Alternative Facility traffic on Pimlico Link Road and other nearby affected roads during construction and decommissioning phases	Short-term, negligible to minor adverse impacts may occur (predicted BNL change <3.0 dB). No significant adverse effects are anticipated.	Not significant
	Noise from the Alternative Facility traffic on Pimlico Link Road and other nearby affected roads, and noise from within the Alternative Facility, during the operational phase	Short-term, negligible to minor adverse impacts may occur (predicted BNL change <3.0 dB and predicted noise levels <SOAEL values). No significant adverse effects are anticipated.	Not significant
New House	Vibration from construction activities undertaken in the vicinity of New House during construction and decommissioning phases	Short term. No significant adverse effects are anticipated, risk of cosmetic damage is considered low.	Not significant

11.7 Conclusion

- 48) The assessment has considered noise and vibration effects from the Alternative Facility during construction, operation, and decommissioning. No significant adverse noise and vibration effects are anticipated from the Alternative Facility. The reasoning for this conclusion is as follows:
- Predicted noise levels during construction and decommissioning remain below SOAEL values for nearby sensitive receptors
 - The change in BNL due to construction and operational traffic on existing roads is predicted to be less than 3.0 dB
 - While the decommissioning phase may involve activities including concrete breaking, predicted noise levels are still predicted to be below SOAEL values
 - Vibration levels during construction at New House, with the adoption of good practice controls, are predicted to remain below the impact criteria for potential cosmetic building damage.
- 49) This chapter does not propose any specific mitigation but does provide general noise and vibration control provisions, set out in Appendix A.2 Construction Code of Practice.