

9. Noise

Introduction

- 9.1 This Chapter provides an Addendum to Chapter 13 Noise of the original Environmental Statement (ES) submitted in March 2014 and to the last review and update Addendum Chapter 2019.
- 9.2 The purpose of this Chapter is to revisit the Noise Impact Assessment to take into consideration any updates to the assessment methodology guidance utilised (where required); summarise the updated background sound survey, completed in March 2023; consider the noise impacts of the latest available predicted traffic flows on the local road network; and update the noise impact assessment itself where required.
- 9.3 This Chapter should be read in conjunction with Chapter 13 Noise of the original ES as there are no changes to the predicted source noise levels from the proposed development, both in terms of predicted plant noise and on-site vehicular movements including those along the access road, from those previously considered.

Background

- 9.4 The original ES March 2014 provided an initial Noise Impact Assessment (NIA) of the proposed development in its' Chapter 13 Noise and Appendix 13.1, hereafter referred to as the 'original ES'. That assessment considered the predicted noise and vibration impacts from the proposed development on its surroundings, both during construction and operational use. It considered the potential impacts on identified sensitive receptors in terms of:
- Predicted noise and vibration levels from construction.
 - Noise from operation of the facilities; and
 - Noise from any change in road traffic associated with the development and its construction.
- 9.5 An Addendum to the ES was later submitted in September 2014 in response to comments received from Antrim Borough Council and Newtownabbey Borough Council Environmental Health Departments and proposed changes to the Incinerator Bottom Ash processing arrangements.
- 9.6 Further noise evidence was also submitted post the Planning Appeals Commission (PAC) hearing (November 2016) which considered the cumulative noise impact of a nearby consented wind farm. It was emphasised at this time that it is not actually appropriate to combine wind farm noise with noise emitted from industrial sources due to the inherently different noise types, wind considerations and assessment methodologies. A cumulative impact assessment was however undertaken at the request of the PAC and the assessment assumed a worst-case scenario for each source.

9.7 In March 2019 a further Addendum was issued to update assessment methodologies where required, update the background sound survey and latest available traffic flows on the local road network, and to consider any additional cumulative assessment required in respect of consented wind turbines. That Addendum is hereafter referred to as the '2019 Addendum'.

Previous Assessments - Conclusions

9.8 The conclusions of the original ES 2014 and subsequent submissions confirmed that:

- The residual effects of the operational plant are assessed as being slightly adverse on the basis that it will be audible, albeit at a low level, at the nearest noise sensitive receptors and within recognised standards.
- When assessed against existing noise levels the impact of the additional traffic on the access route and Boghill Road is assessed as moderate adverse. Should detailed planning be granted for the new dwelling at 32a / 38 Boghill Road this would be designed and constructed with the knowledge that quarrying could resume and hence a moderate adverse assessment is considered appropriate.
- In respect of operational traffic noise, the net effect after mitigation is assessed as slight beneficial on properties fronting the access road and Boghill Road compared to the extant quarry permission. The proposed development will generate a defined and consistent level of traffic movements in contrast to quarrying activity with inevitable fluctuations.
- In terms of operational noise, the assessment of noise impact would be one of minor significance.
- Construction noise is considered to be no worse than when the site operated daily as a quarry and would be of limited duration. The closest property is 380m from the construction area, although properties directly fronting onto the Boghill Road improvements will experience disturbance albeit for a limited period and hence the residual effects are assessed as slight adverse.
- In terms of construction noise, the impact of the proposed scheme is assessed as minor significance; and
- The cumulative impact assessment with the nearby consented wind farm concluded that predicted night-time noise limits are not exceeded at nearby noise sensitive receptors as prescribed by ETSU R-97. All receptors were predicted to comfortably comply with the upper day and night-time limits. In addition, the cumulative impact was not found to lead to any breach of any standards or noise limits.

9.9 The conclusions of the 2019 Addendum confirmed that:

- The re-assessment of the operational noise impact of the proposed scheme remained as per the previous conclusions identified in the original ES Chapter 13 *Noise*, i.e. of minor significance.

- The construction noise and vibration did not require re-assessment, therefore no changes to the original ES were proposed and the original ES Chapter 13 *Noise* remained valid, as such the associated impact remained as of minor significance.
- The revised cumulative impact did not result in any breach of any standards or noise limits. The original conclusions therefore remain unchanged.

Reasons for Addendum 2023 - Noise

- 9.10 The original and previously updated background sound surveys were undertaken in 2012, 2013 and 2018. As such, it was considered prudent to undertake a new survey to reflect current existing conditions in 2023 and consider if any changes in background sound levels would result in changes in impacts.
- 9.11 Updated traffic data (Existing Year 2023) and predicted traffic data is now available for the revised year of opening (2028). This data has been utilised in the updated assessment of noise levels on key links on the wider local road network.
- 9.12 The predicted source noise levels from the proposed scheme, both in terms of plant noise and on-site vehicular movements (including on the access track) are not anticipated to have changed; consequently, this data from the original ES Chapter 13 remains relevant to this current Addendum Chapter 2023.
- 9.13 The predicted source noise levels from the wind turbine schemes proposed in the vicinity are also not anticipated to have changed as no changes to proposals have been submitted and no additional schemes have been proposed during the intervening period; consequently, data presented in the 2019 Addendum remains relevant to this current Addendum Chapter 2023.

Methodology

- 9.14 This Addendum has adopted the same methodologies as used for the original ES (see Paragraphs 13.10 to 13.39 from the original ES) and updated in the noise 2019 Addendum, unless revised as stated below.

BS 4142:2014+A1:2019

- 9.15 BS 4142:2014 '*Methods for Rating and Assessing Industrial and Commercial Sound*' came into effect on 31st October 2014, with amendments made on 30 June 2019 to create BS 4142:2014+A1:2019.
- 9.16 The 2014+A1:2019 edition clarifies the application of the standard and recognises the importance of the context in which a sound occurs. This edition retains the matter of uncertainty, including good practice for reducing uncertainty, which was new in the 2014 edition.
- 9.17 In its Commentary on Section 11 (Item 1) this edition states that 'where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night'.

9.18 In this 2023 Noise Addendum, BS 4142:2014+A1:2019, which now takes context into account, has been used to assess the potential impact of the proposed plant, activities and on-site vehicular movements, including traffic on the access road to the development, where noise of an industrial nature dominates.

Noise and Vibration Management (NVM): Environmental Permits Guidance (EPG) 2021/2022 and Method Implementation Document (MID) BS 4142:2023

9.19 The NVM: EPG, produced collaboratively by the combined four devolved UK Environment Bodies, including the Northern Ireland Environment Agency (NIEA), was published on 23 July 2021, and was last updated on 31 January 2022 (NVM: EPG 2021/2022).

9.20 This guidance states that when applying for new or varied Environmental Permits, and when submitting sound monitoring and assessments to UK Environment Agencies, this guidance must be followed, and the requirements of BS 4142 and the MID for BS 4142 must also be adhered to.

9.21 The MID for BS 4142 was published on 27 March 2023. Although this MID specifically states that it applies to England, it has been referred to for this Addendum since it is mentioned in the NVM EPG 2021/2022.

9.22 The MID BS 4142:2023 supplements BS 4142:2014+A1:2019 to ensure that the standard is applied consistently. This MID must be followed when applying for new or varied Environmental Permits and when submitting sound monitoring and assessments to UK Environment Agencies.

DMRB LA 111, 2020

9.23 The assessment of operational traffic noise on the local road network has followed the methodology outlined in the Design Manual for Roads and Bridges (DMRB) LA 111 Noise and Vibration, Revision 2, published 27 May 2020, this having superseded the methodology used in the original ES and the 2019 Addendum, namely DMRB 11.3.7¹.

9.24 The methodology has introduced modifications to the Calculation of Road Traffic Noise (CRTN) methodology.

9.25 The original significance rating in the ES in (Table 13.1 of original ES 2014) is to be retained. DMRB uses a two stage process with the consideration of both short- and long-term impacts using the magnitude of change identified in Table 3.54a and Table 3.54b of DMRB LA 111, as copied below. The short term impact significance ratings do not take context into account, and depending on the context the short or long term significance criteria can be applied. The original ES which uses the numerical equivalent of the DMRB LA 111 long term magnitude of change, is a one step process, where DMRB allows context to modify the short term impacts significance ratings.

¹ The Highways Agency, Design Manual for Roads and Bridges (DMRB), Volume 11 - Environmental Assessment, Section 3 - Environmental Assessment Techniques, Part 7 – Noise and Vibration 2011.

DMRB LA 111 (May 2020) Table 3.54a Magnitude of Change - short term

Short term magnitude	Short term noise change (dB LA10,18hr or Lnight)
Major	Greater than or equal to 5.0
Moderate	3.0 to 4.9
Minor	1.0 to 2.9
Negligible	less than 1.0

DMRB LA 111 (May 2020) Table 3.54b Magnitude of Change - long term

Long term magnitude	Long term noise change (dB LA10,18hr or Lnight)
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	less than 3.0

9.26 For these assessments the original ES significance ratings, as detailed below, have been retained based on the assessment that the long term impact is predicted to be less than the short term impact so their continued use is justified and allows readers to readily compare with the previous assessment in 2014.

Arc21 original ES Table 13.1 – Semantic Scale for Rating Noise Impact & Significance Rating

Predicted Change In LAeq,T or LA10,T	Semantic Scale Rating	Significance Rating	
Decrease of more than 10.0 dB	Substantial	Major	Beneficial
Decrease of 5.0 – 9.9 dB	Moderate	Moderate	Beneficial
Decrease of 3.0 – 4.9 dB	Minor	Minor	Beneficial
Decrease of 0.1 – 2.9 dB	Slight	Negligible	~
0.0 dB	No Change	Negligible	~
Increase of 0.1 – 2.9 dB	Slight	Negligible	~
Increase of 3.0 – 4.9 dB	Minor	Minor	Adverse
Increase of 5.0 – 9.9 dB	Moderate	Moderate	Adverse
Increase of more than 10.0 dB	Substantial	Major	Adverse

Wind Turbine Sound

9.27 The cumulative impact assessment with the nearby consented wind farm has followed the same methodology and noise limits as the original ES 2014 and the 2019 Addendum, namely 'The Assessment and Rating of Noise from Wind Farms ETSU R-97', published September 1996. ETSU-R-97 remains the current guidance, although it is noted that a report was issued in May 2023, commissioned by the UK Government (including the Northern Ireland Executive), that

reviewed current noise guidance for onshore wind turbines. That 2023 Report² recommends areas of the ETSU-R-97 guidance that would benefit from being updated, including revisiting the framework of noise limits, but does not provide new guidance or supersede any parts of the current policy or guidance frameworks in place in any of the devolved administrations.

Compendium of WHO and other UN Guidance on Health and Environment 2022 Update

9.28 Chapter 11 Environmental Noise of the Compendium of WHO and other UN Guidance on Health and Environment 2022 update states the same WHO noise exposure limits for road traffic noise and wind turbine noise as the WHO Environmental Noise Guidelines 2018 used in the 2019 Addendum.

Explanation of Baseline Conditions

Baseline Sound Conditions: Current

9.29 An updated survey of existing background sound was completed by Lester Acoustics LLP in March 2023. The survey locations were as close as practicable to the original locations (used for the 2014 ES and 2019 Addendum, as agreed with the Environmental Health Department of Antrim and Newtownabbey Borough Council) as detailed below and shown in Figure 9-1 and Figure 9-2 thereafter, namely:

- Location 01 - in the vicinity of No.62 Upper Hightown Road; (moved north closer to the property, now at property's southern garden boundary)
- Location 02 - in the vicinity of No.120 Flush Road; (now moved further south-east along Flush Road, still on same side of road as No.115 Flush Road as before)
- Location 03 - in the vicinity of No.65 Flush Road; (as per the original)
- Location 04 - No.40 Boghill Road; (now situated in the eastern extent of the garden); and
- Location 05 - No.32 Boghill Road, (now situated on the quarry site access road, south-west of the original position).

9.30 In order to establish the background sound levels in 2023, NTi Audio XL2TA Handheld Audio and Acoustic Analyzer Type 1 Sound Level Meters (SLM) were sited at each of the five representative locations and monitored background sound levels between Tuesday 7th March and Thursday 16th March 2023.

9.31 All surveys were undertaken in free-field locations and were in accordance with advice given on 'Precautions against Interference' and 'Weather Conditions' contained in BS 4142:2014+A1:2019.

² Department for Business, Energy & Industrial Strategy, WSP, A Review of Noise Guidance for Onshore Wind Turbines, Project Report, Revision 04 PUBLIC, 31 May 2023.

- 9.32 As previously, the background sound level was measured at each location in A-weighted decibels in a range of statistical indices that describe the variation in sound levels, including the level exceeded for 90% of the time (L_{A90}) and the equivalent continuous sound level (L_{Aeq}).
- 9.33 Table 9.1 and Table 9.2 below summarise the 2023 background sound levels together with those used in the original ES 2014 and the 2019 Addendum.
- 9.34 BS 4142:2014+A1:2019 advises that the typical background sound levels to which the predicted future noise from the proposed development will be compared should be reliable and suitably representative, and not necessarily simply the lowest or the mode level³. The 2012/13 assessment was based on the lowest three levels, which are now assessed as typical levels for the 2023 assessment.

³ BS 4142:2014+A1:2019 *Methods for Rating and Assessing Industrial and Commercial Sound*, Commentary on 8.1:
In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods.

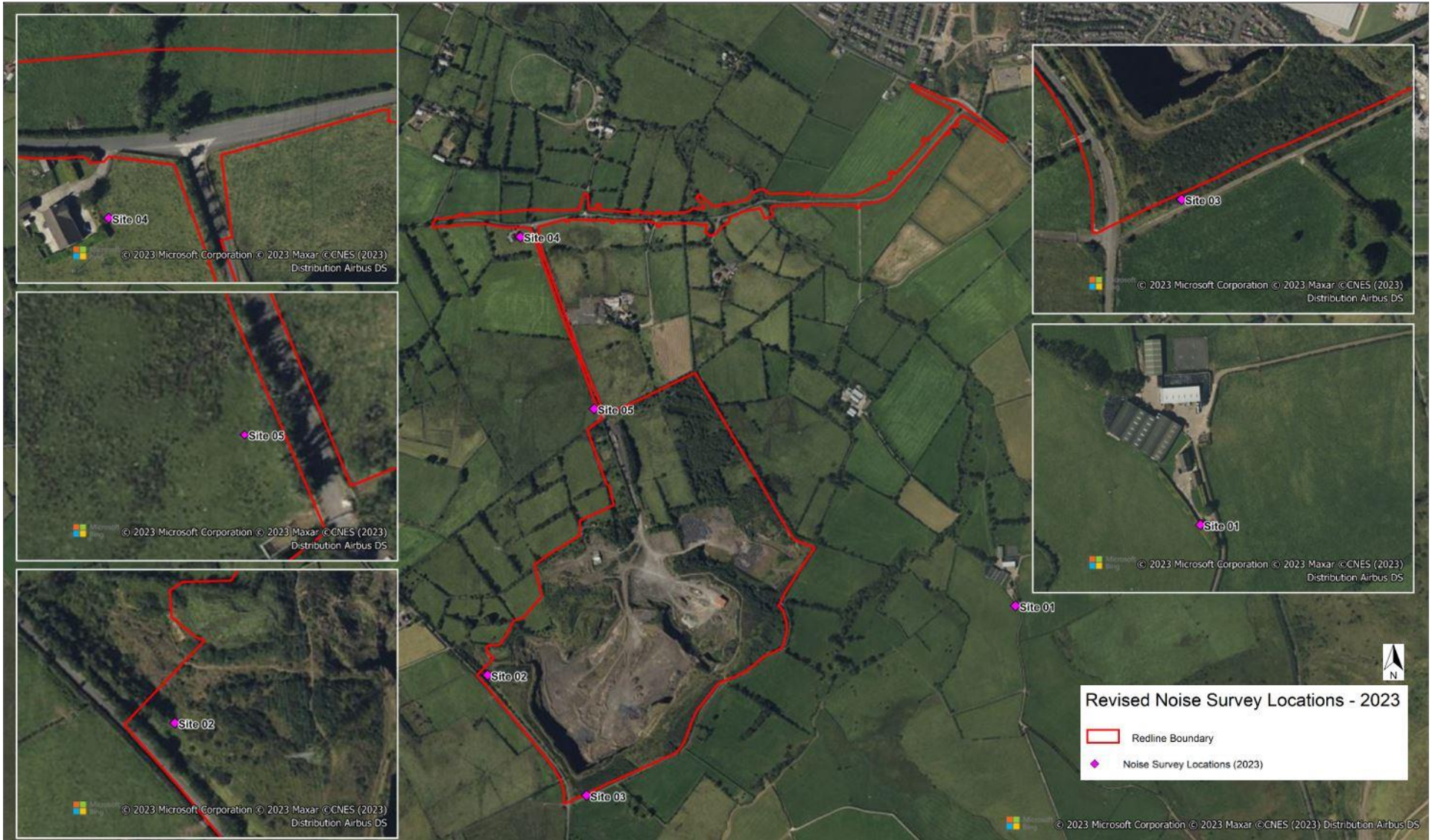


Figure 9.1 Baseline Sound Survey Measurement Locations: Revised 2023

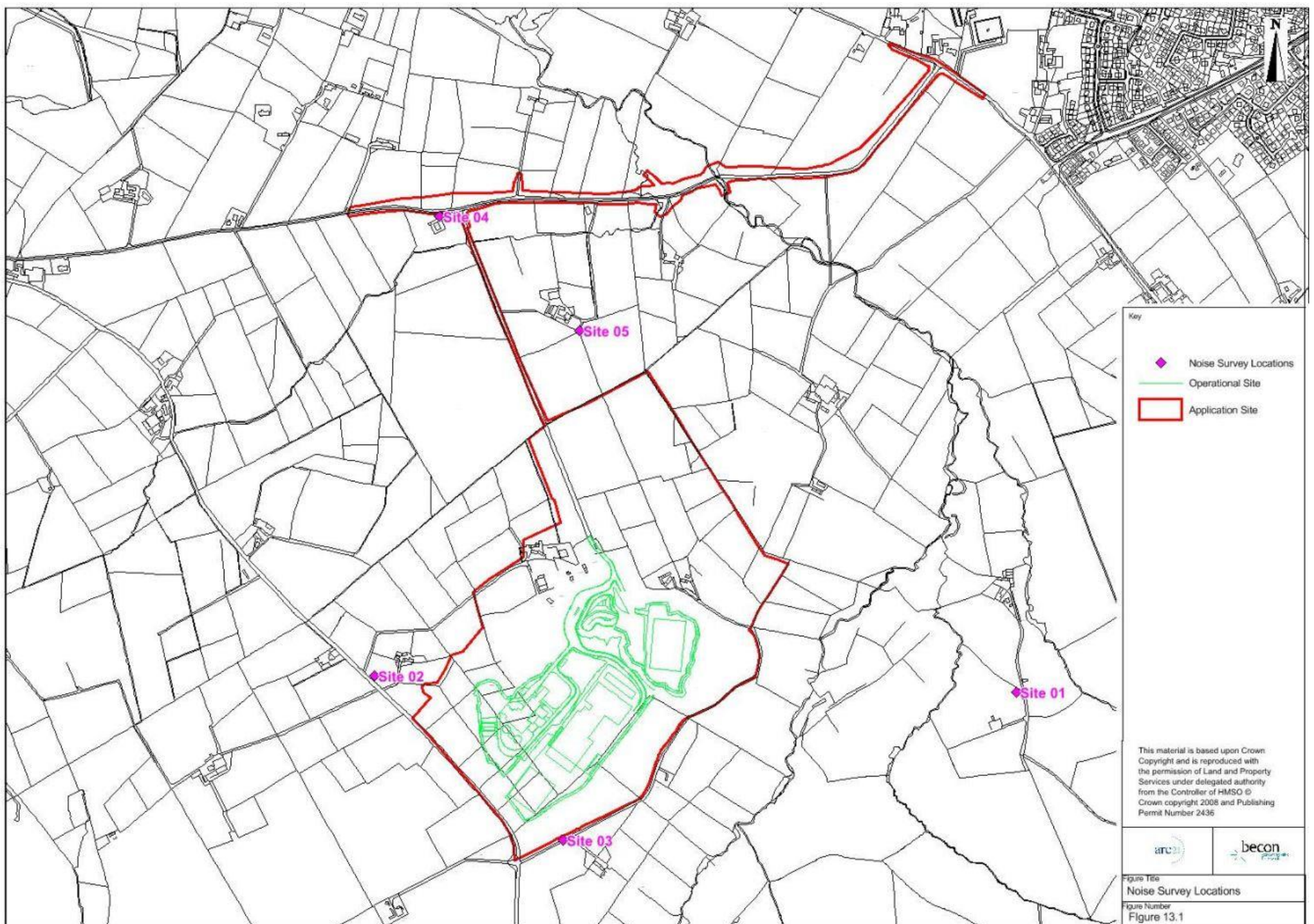


Figure 9.2 Baseline Sound Survey Measurement Locations: Original 2014 ES and 2019 Addendum

Table 9.1 Summary of Background Sound Survey Results: Daytime

Location		Survey 2012 /		Survey 2018		Comment 2012 vs 2018	Background Adopted in 2018 Assessment		Survey 2023		Comment 2012/18 vs 2023	Background Adopted in 2023 Assessment	
		L _{Aeq}	L _{A90}	L _{Aeq}	L _{A90}		L _{Aeq}	L _{A90}	L _{Aeq}	L _{A90}		L _{Aeq}	L _{A90}
Location 01	No.62 Upper Hightown Road (in the vicinity thereof)	47.2	35.5	40.0	36.8	Slight increase in LA ₉₀ level so background used retained		36	Weekday 45.9 Weekend 43.7	Weekday 40.0 Weekend 40.0	Slight increase in in LA ₉₀ level so background used retained		36
Location 02	No.120 Flush Road (in the vicinity thereof)	43.0	34.4	41.3	34.7	Slight increase in LA ₉₀ level so background used retained		34	Weekday 46.5 Weekend 44.1	Weekday 38.0 Weekend 36.0	Slight increase in LA ₉₀ level so background used retained		34
Location 03	No.65 Flush Road (in the vicinity thereof)	53.8	39.4	35.7	31.3	Moderate reduction in LA ₉₀ level so background used reduced		32	Weekday 42.9 Weekend 41.2	Weekday 33.0 Weekend 33.0	Slight increase in 2018 LA ₉₀ level so background used retained		32.0
Location 04	No.40 Boghill Road	50.5	38.1	49.6	39.1	Slight increase in in LA ₉₀ level so background used retained		38	Weekday 50.5 Weekend 46.8	Weekday 44.0 Weekend 40.0	Slight increase in LA ₉₀ level so background used retained		38.0
Location 05	No.32 Boghill Road	42.2	36.2	42.1	38.1	Slight increase in in LA ₉₀ level so background used retained		36	Weekday 42.8 Weekend 47.1	Weekday 38.0 Weekend 31.0	Slight decrease in LA ₉₀ level but survey point further from road so original background used retained		36.0
<p>Notes: Sound Survey 2012 by Atkins Ltd between Tuesday 14th and Monday 20th August 2012. Derived from Lowest Three 1-hour periods.</p> <p>Sound Survey 2018 by Atkins Ltd between Friday 30th November and Thursday 6th December 2018. Representative (25 % ile) LA_{eq}, 1 hour and LA₉₀, 1 hour.</p> <p>Sound Survey 2023 by Lester Acoustics between Tuesday 7th March and Thursday 16th March 2023. Representative LA_{eq},1 hour (log average) and LA₉₀,1 hour (modal level of the arithmetic average LA₉₀, 1hour).</p>													

Table 9.2 Summary of Background Sound Survey Results: Night-time

Location		Survey 2012		Survey 2018		Comment 2012vs 2018	Background Adopted in 2018 Assessment		Survey 2023		Comment 2012/2018 vs 2023	Background Adopted in 2023 Assessment	
		L _{Aeq}	L _{A90}	L _{Aeq}	L _{A90}		L _{Aeq}	L _{A90}	L _{Aeq}	L _{A90}		L _{Aeq}	L _{A90}
Location 01	No.62 Upper Hightown Road (in the vicinity thereof)	32.7	26.7	31.7	27.4	Slight increase in LA ₉₀ level so background used retained		27	Weekday 42.5 Weekend 37.5	Weekday 36 Weekend 25	Slight decrease in LA ₉₀ so background reduced		26
Location 02	No.120 Flush Road (in the vicinity thereof)	32.3	29.7	31.9	27.0	Slight decrease in LA ₉₀ so background used reduced		27	Weekday 41.5 Weekend 41.1	Weekday 34 Weekend 24	Slight decrease in in LA ₉₀ level so background used reduced		26
Location 03	No.65 Flush Road (in the vicinity thereof)	49.6	35.1	30.6	25.7	Moderate reduction in LA ₉₀ level so background used reduced		26	Weekday 37.9 Weekend 37.8	Weekday 27 Weekend 28	Slight increase in LA ₉₀ level so background used retained		26
Location 04	No.40 Boghill Road	32.7	31.6	38.7	34.2	Slight increase in LA ₉₀ level so background used retained		32	Weekday 44.2 Weekend 43.9	Weekday 39 Weekend 30	Slight decrease in LA ₉₀ so background used reduced		31
Location 05	No.32 Boghill Road	36.8	34.9	36.0	33.9	Slight decrease in LA ₉₀ so background used retained		35	Weekday 38.6 Weekend 37.8	Weekday 35 Weekend 20	Substantial decrease in weekend readings, but location further from road and readings not considered typical so original background adopted		35.0
<p>Notes: Sound Survey 2012 by Atkins Ltd between Tuesday 14th and Monday 20th August 2012. Derived from Lowest Three 1-hour periods.</p> <p>Sound Survey 2018 by Atkins Ltd between Friday 30th November and Thursday 6th December 2018. Representative (25 % ile) LA_{eq},15 minutes and LA₉₀, 15 minutes.</p> <p>Sound Survey 2023 by Lester Acoustics between Tuesday 7th March and Thursday 16th March 2023. Representative LA_{eq},15 minutes (log average) and LA₉₀,15 minutes (modal level of the arithmetic average LA₉₀, 15minutes).</p>													

Baseline Sound Conditions: Future – Industrial Noise

- 9.35 A review has been undertaken of the recently approved (14/03/2023) planning application (LA03/2022/0649/F) at the application site for the ‘erection of a replacement Coated Roadstone Plant and associated ancillary development to include bitumen storage tanks; aggregate and recycled asphalt pavement storage bays; hoppers; storage silos and conveyors’ to determine awareness of the potential future baseline at the site.
- 9.36 A Noise Impact Assessment Report (hereafter referred to as the Northstone NIA)⁴ was submitted in support of that application, completed in accordance with Planning Practice Guidance: Assessing Environmental Impacts from Mineral Extraction – Noise (PPG March 2014). This report was based on the survey findings of the arc21 noise assessment from 2019.
- 9.37 The Asphalt Plant will operate during the daytime and also during night-time hours, depending on the contractual requirements of DFI Roads; during the night-time periods no other quarrying related activities will occur.
- 9.38 Should the proposed development be built, this will not co-exist with the replacement plant and hence has not been considered further in this assessment.

Baseline Sound Conditions: Future – Road Noise

- 9.39 In this Addendum, the future road noise levels from potential changes in traffic levels are taken into account in the revised assessment which considers the updated Opening Year 2028 and Design Year 2043, and also reflects changes in traffic flows on the local road network of the Existing Year 2023.

Potential Noise Sensitive Receptors

- 9.40 An online review was undertaken in May 2023 of Northern Ireland’s Planning Portal⁵ of planning applications submitted and/or approved in the intervening period since the 2019 Addendum; this review identified that there are no additional noise sensitive receptors to consider regarding the potential impact of noise from the Arc21 Site itself (including the access road). Any additional properties approved or built since the previous assessment are located further away from the Arc21 site than those already assessed. As such it remains appropriate to assess the eight previous receptors as the closest representative receptors to the proposed scheme, therefore Table 13.5 *Noise Sensitive Receptors* in the original ES remains valid.
- 9.41 As stated in the 2019 addendum the previously proposed property No.32a / 38 Boghill Road has yet to be constructed, and that no associated reserved matters application was made, and as such the outline planning permission has since lapsed (expired on 21/08/2016). However, calculations have still been updated for this potential property due to its proximity to the scheme,

⁴ Quarry Plan / Northstone, Proposed Hightown Quarry Coated Roadstone Plant, Noise Impact Assessment, AONA Environmental Consulting Ltd, Final Report, 20 June 2022.

⁵ Northern Ireland Public Register (planningsystemni.gov.uk)

and most notably to the scheme's access road. Table 13.5 *Noise Sensitive Receptors* in the original ES therefore also remains valid for this property too.

9.42 Regarding potential receptors that are located within the vicinity of the assessed links of the local road network, but over 900m away from the application site boundary. The review of Northern Ireland's Planning Portal undertaken in May 2023 identified the additional potential residential and commercial receptors identified in Table 9.3. Consideration of the potential impact on these additional receptors is covered in the assessment of the noise impact of the relevant links of the proposed scheme

Table 9.3 Planning Applications: within the vicinity of the Assessed Local Road Network

Local Road Network LINK	Direction / Distance from Arc21 Site Boundary	Application Summary	Location	Date of Decision
Hydepark Road Link 2 / Link 2a	905m ENE	<u>LA03/2020/0434/F</u> RESIDENTIAL 1x Dwelling & Garage	approx. 280m South West of 120 Hydepark Road Newtownabbey BT36 4PZ	12 Oct 2020 Granted
Hightown Road Link 3 / Link 3a	1,600m ENE	<u>LA03/2022/0042/O</u> MIXED USE comprising petrol filling station, local supermarket with apartments on first floor, care home	Land to the south of Hightown Road and 30m East of Holly Manor and 20-30 (evens) Hollybrook Manor Glengormley	29 March 2023 Granted
Hightown Road Link 3 / Link 3a	1,750m ENE	<u>LA03/2018/0503/F</u> RESIDENTIAL 28x dwellings including landscaping garages access and all other associated site works	Lands between 112 & 120 Hightown Road and immediately West of Edmund Rice College Newtownabbey BT36 7AU	20 June 2019 Granted
Hightown Road Link 3 / Link 3a	1,800m ENE	<u>LA03/2018/0421/F</u> RESIDENTIAL 38x dwellings including landscaping garages access and all other associated site works	Lands between 112 and 120 Hightown Road and immediately west of Edmund Rice College Newtownabbey BT36 7AU	30 May 2019 Granted
Scullions Road Link 5	1,930m NNE	<u>LA03/2021/0722/F</u> CAR RENTAL + OFFICE car rental facility with 2 no. access points, office with wash bay structure and staff/visitor parking areas	2 Hightown Avenue Mallusk Newtownabbey	12 Oct 2021 Granted
Mallusk Road (B95) Link 4a / 4 and Scullions Road	1,900m NNE	<u>LA03/2018/0203/F</u> WAREHOUSE + OFFICE Storage and distribution warehousing ancillary office and staff welfare accommodation associated access and parking arrangements sprinkler tanks and associated plant. The development	1-17 Hightown Avenue Mallusk Newtownabbey BT36 4RT	21 May 2018 Granted

Link 5		will be part refurbishment of warehousing, part demolition and rebuild and part new build extension.		
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9.43 Other Residential Planning Applications of potential interest identified in the May 2023 review included: 1 replacement dwelling at No.100 Upper Hightown Road (LA03/2017/0569/O), 98 dwellings on HydePark Road / Mayfield Link (LA03/2022/0597/F), 55 dwellings on HydePark Lane (LA03/2021/0548/F), 162 dwellings on Park Road (LA03/2019/0667/F) and 14 dwellings on Antrim Road (LA03/2019/0127/F); however, these residential applications are not in the vicinity of either the application Site (<900m) or the assessed local road network links and as such are not considered further in this 2023 Addendum.

Assessment: Predicted Environmental Effects and their Significance (Operation)

Key Noise Sources

9.44 The key noise sources and materials used in the cladding of buildings remain unchanged and hence Table 13.6 – Table 13.8 in the original ES remain unchanged.

Noise Impact due to Operational Site

9.45 The source noise levels and assessed receptors have remained unchanged and hence the predictions of source noise levels at the receptors from the plant in Table 13.9 of the original ES Noise Chapter have not changed.

9.46 The operational noise impact has been re-assessed however to take into consideration the updated 2023 background sound levels and to follow the BS 4142:2014+A1:2019 methodology; this reassessment is summarised in Tables 9-5 and 9-6 below, which supersede the original ES Tables 13.10 and 13.11 and 2019 Addendum Tables 9.4 and 9.5.

9.47 Traffic noise from the access road will be the dominant noise source during the daytime for the three assessed Boghill Road properties, as such a BS 4142:2014+A1:2019 assessment is not considered to be entirely appropriate as the traffic impact is dominant over the potential impact of the operational noise, and as such the potential impact indicated by the BS 4142 assessment is skewed by the traffic. The impact of the proposals on the three assessed Boghill Road properties would be more appropriately assessed by considering the operational traffic impact not using BS 4142:2014+A1:2019, but these properties have been included in Table 9.4 and Table 9.5 for completeness.

Table 9.4 BS 4142 Noise Assessment: Night-time Noise Levels (Table 13.10 / Table 9.4)

Receptor	Specific Noise Level, dB LAeq^[1]	Rating Level, dB LAeq	Measured Night-time Background Level , dB LA90 for 2023 update	Assessment Level (dB LA_r – LA90)	Impact Significance taking Context into Account
Outline Planning Property 32a / 38 Boghill Road (Survey Location 05)	32	34	35	-1	Proposed noise is below background. Negligible Significance
32 Boghill Road (Survey Location 05)	32	34	35	-1	Proposed noise is below background. Negligible Significance
40 Boghill Road (Survey Location 04)	30	32	31	+1	Proposed noise is slightly above background. Negligible Significance
65 Flush Road (Survey Location 03)	27	29	26	+ 3	Rating and Background Sound Level very low. Minor Adverse Significance
120 Flush Road (Survey Location 02)	33	35	26	+9	Moderate Adverse Significance
133 Flush Road	30	32	26	+6	Rating and Background Sound Level very low. Moderate Adverse Significance
62 Upper Hightown Road (Survey Location 01)	26	28	26	+2	Rating and Background Sound Level very low. Negligible Significance
Upper High Town	28	30	26	+4	Rating and Background Sound Level very low. Minor Adverse Significance

9.48 The night-time assessment summarised in Table 9.4 above indicates that the proposed scheme will have a ‘negligible significance’ impact on the three assessed Boghill Road properties and on No.62 Upper Hightown Road. Although No.65 Flush Road and Upper High Town are predicted to experience an operational noise level elevated above background, this is expected to be of ‘minor significance’ due to the low noise levels. For No.120 Flush Road and No.133 Flush Road the impact is of ‘moderate adverse significance’ when the context of absolute levels is taken into account.

9.49 Compared to the 2019 assessment some properties now have a minor increase in the assessment noise level (less than or equal to 1dB) which due to rounding and lower predicted

^[1] Model R9 December 2013 freefield (Table 13.9)

background levels changes the significance at 133 Flush Road from minor adverse to moderate adverse.

Table 9.5 BS 4142 Noise Assessment: Daytime Noise Levels (Table 13.11 / Table 9.5)

Receptor	Specific Noise Level, dB LAeq ^[3]	Rating Level, dB LAeq	Measured Day-time Background Level, dB LA90 2023	Assessment Level (dB LAr – LA90)	Impact Significance taking Context into Account
Outline Planning Property 32a / 38 Boghill Road	52.0	54	36.0	+18.0	Noise from Access Route dominant (see Access Route Assessment)
32 Boghill Road (Survey Location 05)	46.2	48	36.0	+12	Noise from Access Route dominant (see Access Route Assessment)
40 Boghill Road (Survey Location 04)	50.4	52	38.0	+14	Noise from Access Route dominant (see Access Route Assessment)
65 Flush Road (Survey Location 03)	31.3	33	32.0	+1	Proposed noise is slightly above background. Negligible Significance
120 Flush Road (Survey Location 02)	39.1	41	34.0	+7	Moderate Adverse Significance
133 Flush Road	38.2	40	34.0	+6	Moderate Adverse Significance
62 Upper Hightown Road (Survey Location 01)	37.1	39	36.0	+3	Minor Adverse Significance
Upper High Town	34.1	36	36.0	0	Negligible Significance

9.50 The daytime assessment summarised in Table 9.5 indicates that the proposed scheme impact will have a 'negligible significance' for No.65 Flush Road and Upper High Town. The scheme's impact on No.62 Upper Hightown Road is considered to be of 'minor adverse significance' due to the relative noise levels compared to background and LAeq levels and 'moderate adverse' on No. 120 and No.133 Flush Road. There is no change to the assessment contained within the 2019 addendum.

9.51 Although context is taken into account, as before, the assessment conservatively ignore the context of the former quarrying activities.

^[3] Model R9 December 2013 freefield (Table 13.9)

Noise Impact due to Operational Traffic

9.52 The predicted noise impact due to operational traffic has been revisited to take into consideration the new background sound levels, the latest traffic data on the local road network (Existing Year 2023), and the revised opening year of 2028.

Operational Assessment: Traffic - Site Access

9.53 The assessment of the impact of site access traffic has been updated although the traffic flows and speeds on the access road remain as previously assessed, the baseline sound levels have been updated to the 2023 survey levels. This reassessment is summarised in Table 9.6 below, which supersedes the original ES Table 13.12 and 2019 Addendum Table 9.6.

9.54 The significance rating assessed in Table 9.6 is as per the original ES criteria. Table 9.6

Table 9.6 Access Road vs Daytime Noise Levels (Table 13.12 / Table 9.6)

Receptor	Peak Hr Noise Level dB LAeq	Measured Day-time Background Level dB LAeq 2023	Combined dB LAeq	Difference	Significance
40 Boghill Road (Survey Location 04)	50.4	49.5	53.0	3.5 dB(A)	Minor Adverse
34 Boghill Road (Survey Location 04)	57.6	49.5	58.2	8.7 dB(A)	Moderate Adverse
Lapsed Outline Planning Property 32a / 38 Boghill Road (Survey Location 05)	52.0	43.5	52.6	9.1 dB(A)	Moderate Adverse
32 Boghill Road (Survey Location 05)	46.2	43.5	48.1	4.6 dBA	Minor Adverse
26 Boghill Road (Survey Location 05)	46.6	43.5	48.3	4.8 dB(A)	Minor Adverse

- 9.55 The assessment shows a minor improvement to most properties compared to the 2019 assessment due to slightly higher background daytime noise levels. The impact at 32a/ 38 Boghill impact reduces from Substantial Adverse to Moderate Adverse and 26 and 32 Boghill reduces from Moderate adverse to Minor adverse.
- 9.56 In the event that the proposed development is not implemented the established use of the site as a quarry with unrestricted planning permission will continue and has the potential to scale up to meet market demand and the proposed Northstone Asphalt Plant traffic would also use this route if constructed.
- 9.57 The WHO 2018 guidelines suggest that the Daytime L_{den} for Road Traffic Noise is to be below 53 dB L_{den} which is the equivalent noise over a 24-hour period so the following table is a simplified conservative estimate as it uses peak hour traffic flows and there will effectively be no HGV's after 19:00 hrs and only effectively plant noise after 19:00 hrs.
- 9.58 Table 9.7 below shows the calculations for the most critical properties i.e. No.34 Boghill Road, No. 32a / 38 Boghill Road and No.120 Flush Road.
- 9.59 With the exception of No.34 Boghill Road, all other assessed properties in the vicinity of the access road will be compliant with the WHO 2018 guidelines for road traffic impacts.
- 9.60 The new assessment shows a minor reduction in noise impacts. As previously stated in the 2019 addendum Peak HGV flows are 42/hr, but average daytime flows are 24/hr which is approximately a halving of traffic and hence road generated noise will be about 3 dB less averaged over the day and there are effectively no HGVs after 19:00 hrs. Ignoring variation in daytime flows/ noise levels, to allow the use of existing conservative predictions the log average of peak day and high night-time predictions including background noise are only greater than 53dB for 34Boghill Road which, without correction for the variation in flows, is predicted to be 56 dB(A) (56 (day) and 44 (night) respectively). As stated, this is a worse-case scenario being based on a peak of 42 HGV / hr for day and evening 7 days a week from the proposed plant with no extra traffic at night Saturday afternoon or Sunday.

Table 9.7 WHO Assessment re Site Access Road (worst-case-properties) (Table n/a / Table 9.7)

Receptor	Daytime			Night-time			Calculated Average Noise Level
	Predicted Lden	Background LAeq 2023	Combined LAeq 1 hr	Predicted LAeq 15 min	Background LAeq 2023	Combined LAeq 15 min	
34 Boghill Road (Survey Location 04)	54.6	49.5	55.8	30.1	44.0	44.2	56
Outline Planning Property 32a / 38 Boghill Road (Survey Location 05)	49.0	43.5	50.1	31.8	38.0	38.9	50
120 Flush Road (Survey Location 02)	36.1	46.0	46.4	32.7	41.0	41.6	48
<p>Notes: Background Sound used is the log average of the 2023 Noise Survey at the relevant Survey Location.</p> <p>The predicted noise levels are a worst-case-scenario since they have used peak HGV flows and ignored the real variation in HGV flows.</p> <p>The average noise level was derived by calculating the log average of the Daytime Combined LAeq and the Night-time Combined LAeq.</p> <p>No.34 Boghill Road and No.32a / 38 Boghill Road were assessed since they have the loudest Daytime Source LAeq.</p> <p>No. 120 Flush Road was assessed since it had the loudest Night-time Source LAeq</p>							

Operational Assessment: Traffic – Local Road Network

9.61 The assessment of operational traffic noise on the local road network has been revisited to follow the current DMRB Guidance 2020⁶, and to take into consideration the updated Opening Year of 2028 and Design Year of 2043 and updated traffic forecasts. Accordingly, Paragraphs 13.93 to 13.97 and Table 13.14 of the original ES and Paragraphs 9.42 & 9.43 and Table 9.8 of the 2019 Addendum have now been updated by the following.

9.62 The revised assessment, summarised in Table 9.8 below, identifies that the change in noise level on each of the assessed road links is below +1dB. This was also the case in Table 13.14 of the original ES 2014 and Table 9.8 of the 2019 Addendum, and as such the conclusion of the original assessment that the change in noise levels from scheme traffic on the local road network is not significant remains valid.

Table 9.8 Predicted Change in Noise Levels on Key Road Links (Table 13.14 / Table 9.8)

Link No.	Link Description	2043 without Development			2043 with Development			Predicted Noise – Without Development	Predicted Noise With Development	Change in Noise level L10 18 hr
		AAWT	% HGV's	Speed MPH	AAWT	% HGV's	Speed MPH			
1	Boghill Road	497	18.4%	60	766	29.9%	60	N/A	N/A	N/A
2	Hydepark Road	6424	8.1%	60	6693	9.9%	60	68.9	69.1	0.2
2a	Hydepark Road	6622	8.1%	60	6894	9.9%	60	69.0	69.2	0.2
3	Hightown Road	10290	3.9%	40	105314	5.3%	40	67.1	67.2	0.1
3a	Hightown Road	16103	3.8%	40	16343	4.7%	40	69.0	69.1	0.1
4	Mallusk Road	12688	4.5%	40	12874	5.7%	40	68.0	68.1	0.1
4a	Mallusk Road	17335	10.4%	40	17543	11.3%	40	69.4	69.4	0
5	Scullions Road	28120	10.1%	40	28294	10.5%	40	71.5	71.5	0.

⁶ The Department for Infrastructure, Design Manual for Roads and Bridges (DMRB), Sustainability & Environment Appraisal, LA 111 Noise and Vibration, Revision 2, 27 May 2020.

Description of Proposed Mitigation Measures (Operational)

9.63 No changes to the proposed mitigation measures in Paragraphs 13.98 to 13.100 of the original ES are proposed with respect to noise.

Assessment: Cumulative Impact – Proposed Facility and Consented Local Windfarms

9.64 A site visit undertaken in June 2023 identified that none of the previously considered wind farms appear to be operational, and indeed appear to not be fully constructed yet, with only one site being observed to be under construction, see summary in Table 9.9 below.

Table 9.9 Wind Farms in the Vicinity of the Arc21 Site – Site Visit & Review June 2023

Application Ref / No. of Turbines	Location	Site Visit June 2023	GoogleEarth Check (image 24/04/2021)
T/2014/0478/F Granted 23 Dec 2015 5no. Wind Turbines	land approximately 1km North of No.71 Ballytoag Road Belfast Co Antrim BT14 8SS	Excavation underway for 5no. turbines, contractor on site, expected completion July 2024	Indicates that a concrete base area may have been laid (either for 1 of the 5 turbines, or a construction compound)
LA03/2016/0214/F Granted 20 Aug 2018 1no. Wind Turbine	approx. 430m North East of No 60 Ballyutoag Road Belfast	No turbine visible Access restrictions prevented confirming whether or not construction underway.	No evidence of construction
Z/2014/1553/F Granted 04 Nov 2015 1no. Wind Turbine	320 meters South East of 43 Flush Road Ballysillan, Upper Belfast	No turbine or construction visible from Hightown Road or Flush Road. Access restrictions prevented confirming whether or not construction underway.	Indicates that a concrete base area for this 1 turbine may have been laid
Z/2015/0010/F Granted 04 Nov 2015 1no. Wind Turbine	630 meters East/South East of 43 Flush Road, Ballysillan, Upper Belfast, BT14 8SJ	No turbine or construction visible from Hightown Road or Flush Road. Access restrictions prevented confirming whether or not construction underway.	Indicates that a concrete base area for this 1 turbine may have been laid

9.65 The online planning application review undertaken in May 2023 did not identify any additional consented or proposed local windfarms, and the windfarm assessment guidance document remains as ETSU R-97 (September 1996). As such, the assessment of the cumulative impact of the Proposed Facility and Consented Local Windfarms presented in the 2019 Addendum remains unchanged and is not required to be updated.

Conclusions

- 9.66 The original ES 2014 and 2019 Addendum considered the potential noise and vibration impacts from the proposed development on its surroundings, both during construction and operational use.
- 9.67 In terms of operational noise, the original ES 2014 assessed that the noise impact of the proposed development would be of Minor Significance. This re-assessment, incorporating updated assessment methodology, recent background sound data and traffic flows for the new opening year 2028, concludes that the operational noise of the proposed scheme remains as per the previous conclusions identified in the original ES 2014 Chapter 13 *Noise* and 2019 Addendum.
- 9.68 In terms of construction noise and vibration, the original ES 2014 assessed the impact of the proposed scheme as Minor Significance. A re-assessment of construction noise and vibration is not required, therefore no changes to the original ES 2014 are proposed, and the original conclusions identified in ES Chapter 13 Noise remain valid.