HS2

High Speed Rail (West Midlands - Crewe)

Supplementary Environmental Statement 2 and Additional Provision 2 Environmental Statement

Volume 5: Technical appendices

Sound, noise and vibration report (SV-002-000)

February 2019

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Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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A report prepared for High Speed Two (HS2) Limited:

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1 Introduction

1.1 Structure of this appendix

1.1.1 This document is an appendix to the sound, noise and vibration assessment which forms part of Volume 5 of the Supplementary Environmental Statement 2 (SES2) and Additional Provision 2 Environmental Statement (AP2 ES).

1.1.2 This appendix provides details of changes to the sound, noise and vibration assessment since the production of the High Speed Two (HS2) Phase 2a (West Midlands - Crewe) Environmental Statement (ES)[1] published in July 2017 (the main ES), as well as the Supplementary Environmental Statement (SES1) and Additional Provision Environmental Statement (AP1 ES)[2].

1.1.3 This report should be read in conjunction with Volume 5: Appendices SV-001-000, SV-002-001, SV-002-002, SV-002-003, SV-002-004 and SV-002-005 which accompanied the main ES, and Volume 5: Appendix SV-002-000 of the SES1 and AP1 ES.

1.1.4 This document covers the following community areas (CA):

- CA1: Fradley to Colton;
- CA2: Colwich to Yarlet;
- CA3: Stone and Swynnerton;
- CA4: Whitmore Heath to Madeley; and
- CA5: South Cheshire.

1.1.5 Maps referred to in this appendix are contained in the SES2 and AP2 ES Volume 5, Sound, noise and vibration Map Book, Map Series SV-01, SV-02, SV-03 and SV-04.

1.1.6 The SES2 and AP2 ES sound, noise and vibration assessment is detailed in the:

- Volume 2, Community area reports; and
- Volume 5, Appendix (this document).

1.1.7 In order to differentiate between the original proposals assessed as part of the main ES and subsequent changes, the following terms are used:

- 'the original scheme' – the Bill scheme submitted to Parliament in July 2017, which was assessed in the main ES;
- 'the SES1 scheme' – the original scheme with the changes described in the SES1 submitted in March 2018;
- 'the AP1 revised scheme' – the SES1 scheme as amended by the AP1 submitted in March 2018;

[1] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement*, https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement

[2] HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary Environmental Statement and Additional Provision Environmental Statement*, https://www.gov.uk/government/collections/hs2-phase-2a-additional-provision-and-supplementary-environmental-statement-and-march-2018

- 'the SES2 scheme' – the SES1 scheme with the changes described in the SES2;
- 'SES2 changes' – all changes reported in the SES2 that do not require additional powers. These may include new baseline information, changes to the design and construction assumptions, and corrections;
- 'the AP2 revised scheme' – the SES2 scheme as amended by the AP2; and
- 'AP2 amendments' - amendments to the scheme reported in the AP2 ES that include requirements for additional powers in the Bill.

1.2 Scope of the assessment

1.2.1 This assessment is split into two parts for each community area and presents the predicted construction and operational sound, noise and vibration where materially altered by either an SES2 change or an AP2 amendment.

1.3 Methodology, data sources, assumptions and limitations

1.3.1 The assessment scope, key assumptions and limitations are as set out in the main ES Environmental Impact Assessment Scope and Methodology Report and its Addendum (see main ES Volume 5: Appendix CT-001-001[3] and Appendix CT-001-002[4]).

1.3.2 The following SES2 changes have the potential to lead to changes in significant noise effects from those assessed in the main ES:

- CA1, CA2, CA4 and CA5: updates to the construction programme;
- CA1 and CA2: changes to construction traffic flows on site haul routes;
- CA1: Lowering of Kings Bromley viaduct, Bourne embankment and River Trent viaduct (SES2-001-003);
- CA1: Provision of a noise bund near Woodhouse Farm (SES2-001-005);
- CA1: Local placement of surplus excavated material to the south of Pipe Ridware embankment (SES2-001-004);
- CA1: Local placement of surplus excavated material to the south-east of Newlands Lane auto-transformer feeder station (SES2-001-007);
- CA1: Local placement of surplus excavated material to the south of Moreton South embankment (SES2-001-008);
- CA2: Provision of a new underground Openreach telecommunications cable to the Sandon Road auto-transformer satellite compound (SES2-002-101);
- CA2: Extension of a noise fence barrier from Moreton North embankment to Moreton South embankment (SES2-002-001);

[3] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Impact Assessment Scope and Methodology Report, Volume 5: Appendix CT-001-001*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627187/E23_EIA_SMR_CT-001-001_WEB.pdf

[4] HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Scope and Methodology Report Addendum, Volume 5: Appendix CT-001-002*, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627188/E24A_CT-001-002_Part_1_WEB.pdf and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627189/E24-B_CT-001-002_Part_B_WEB.pdf

- CA2: Local placement of surplus excavated material to the south of Moreton cutting (SES2-002-002);
- CA2: Local placement of surplus excavated material to the north of Moreton cutting (SES2-002-003);
- CA2: Local placement of surplus excavated material to the south of Brancote North cutting (SES2-002-007);
- CA2: Local placement of surplus excavated material to the north of Marston North embankment (SES2-002-008);
- CA2: Additional land and a change to Bill powers required for the realignment of the B5066 Sandon Road, diversion of Hopton Lane, extension of Hopton Lane and increased non-motorised user provision across the HS2 route between Hopton and Mount Edge (AP2-002-019);
- CA4: Increase in average mineral excavation depth for the borrow pit west of Netherset Hey Farm (SES2-004-002);
- CA4: Local placement of surplus excavated material to the north of Whitmore South cutting (SES2-004-001);
- CA5: Local placement of surplus excavated material to the south-west of Blakenhall cutting (SES2-005-003);
- CA5: Local placement of surplus excavated material to the north and south of Chorlton Footpath 3 (SES2-005-005);
- CA5: Local placement of surplus excavated material to the east of the Casey Lane diversion (SES2-005-006); and
- CA5: Reconfiguration of the existing West Coast Main Line (WCML) tracks and a new railway systems compound (SES2-005-001).

1.3.3 In some cases, these SES2 changes and AP2 amendments have resulted in a change in traffic flow on roads within the relevant community area. The in-combination effects of SES2 changes and AP2 amendments are presented in the SES2 section.

1.3.4 The following AP2 amendments have the potential to lead to changes in significant noise effects from those assessed in the main ES:

- CA1: Additional land and a change to Bill powers required to make alterations to the Handsacre Junction connection into the West Coast Main Line (AP2-1-001);
- CA2: Additional land required for the provision of a replacement facility for Mayfield Children's Home (AP2-002-001);
- CA2: Additional land and a change to Bill powers required for the removal of Moreton retaining wall and to realign the access track to Moreton House and Moreton House Farm (AP2-002-002);
- CA2: Change to Bill powers required for the diversion of a British Pipeline Agency fuel pipeline and a new utility compound, A51 Lichfield Road (AP2-002-007);

- CA2: Additional land and a change to Bill powers required for the diversion of a National Grid gas pipeline and a new utility compound, north-west of Great Haywood Marina (AP2-002-009);
- CA2: Additional land permanently required for the reconfiguration of Ingestre Park Golf Club (AP2-002-010);
- CA2: Additional land and a change to Bill powers required for the realignment of the B5066 Sandon Road, diversion of Hopton Lane, extension of Hopton Lane and increased non-motorised user provision across the HS2 route between Hopton and Mount Edge (AP2-002-019);
- CA2: Additional land required for construction activities around B5066 Sandon Road, Hopton (AP2-002-020);
- CA2: Additional land and a change to Bill powers for the underground diversion of Western Power Distribution 11kV overhead line, west of the B5066 Sandon Road (AP2-002-112);
- CA3: Additional land required for modifications to the roundabout junction of the A500 Queensway/A519 Newcastle Road/A519 Clayton Road (Hanchurch Interchange) and the signalised crossroads junction of the A519 Newcastle Road/A5182 Trentham Road/B5038 Whitmore Road and a new temporary satellite construction compound (AP2-003-017);
- CA3: Additional land for the underground diversion of a Western Power Distribution 11kV overhead line near North Pirehill Farm (AP2-003-102);
- CA3: Additional land for the diversion of three Severn Trent Water water mains supplies near the A51 Stone Road and Stab Lane (AP2-003-112);
- CA4: Additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002);
- CA4: Additional land required and a change to Bill powers for modifications to the A51 Stone Road/Nantwich Road/A53 Newcastle Road junction (AP2-004-003);
- CA4: Additional land required for provision of a power supply to Madeley tunnel (AP2-004-007);
- CA4: Additional land and change in Bill powers for the diversion of a Cadent medium pressure gas main from Snape Hall Road to Common Lane and Heath Road (AP2-004-101);
- CA4: Additional land and change in Bill powers for the overhead and underground diversion of a Western Power Distribution 11kV overhead line near Manor Farm (AP2-004-103);
- CA4: Additional land for a new Severn Trent Water water mains supply to the Madeley tunnel north portal building (AP2-004-104);

- CA4: Additional land for the diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road (AP2-004-105); and
- CA5: Rail systems modifications and civil engineering works in and around Crewe Station; and removal of rail systems and civil engineering modifications to the Crewe to Cheadle Hulme Line (AP2-005-013).

1.3.5 An assessment of these changes and amendments is presented in this appendix. Details of the standard methodology used for determining significance of effects for sound, noise and vibration are presented in the main ES Volume 5: Appendix SV-001-000.

2 Fradley to Colton (CA1)

2.1 Part 1: Supplementary Environmental Statement 2

Effects during construction

2.1.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Fradley to Colton Community area report.

Avoidance and mitigation measures

2.1.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Fradley to Colton Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

2.1.3 The SES2 changes do not change the likely significant effects identified in the main ES.

Airborne sound: direct impacts and effects

2.1.4 Activities associated with the construction phases of the SES2 scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

2.1.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. Volume 5: Appendix SV-001-000 of the main ES, with the additional information in Table 1, provides an explanation of the information in Table 2 and Table 3. The assessment results, impact criteria and significance criteria for the assessment of the SES2 scheme at residential and non-residential receptors are presented in Table 2 and Table 3 respectively.

2.1.6 The principal SES2 changes responsible for the change in construction noise effect at the specific assessment locations reported in the following tables, are identified in the associated footnotes.

Table 1: Explanatory notes for assessment results – direct construction effects

Symbol	Explanation
	Where the significant effect column is highlighted, then a significant effect is identified at the referenced community, or individual receptor.
	Yellow denotes a low ground-borne noise impact or a minor ground-borne vibration impact.
	Orange denotes a medium ground-borne noise impact or a moderate ground-borne vibration impact.
	Red denotes a high ground-borne noise impact or a major ground-borne vibration impact.
	Dark red denotes a very high ground-borne noise impact.
*	Significant effect – the quantitative impact methodology has identified an impact at this receptor which, based upon further qualitative receptor information does not gives rise to a significant effect.
~	When considered under the significance criteria set out in Volume 5: Appendix SV-001-000 of the main ES, Annex A, Section 1.3, these adverse effects are not considered to be significant on a community basis.
A	Sound levels from HS2 exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in Volume 5: Appendix SV-001-000 of the main ES, Annex A, Section 1.3 are considered when establishing significant effects.
S	Sound levels from HS2 exceed Significant Observed Adverse Effect Level (SOAEL): noise insulation (or temporary rehousing at higher noise levels) therefore provided.
NA	Sound levels from HS2 do not exceed Lowest Observed Adverse Effect Level (LOAEL), therefore generally no adverse effect.
B	Type of receptor – residential.
R	Type of receptor – non-residential.
G1 – G5	Type of receptor – (G1) theatres, large auditoria and concert halls, (G2) sound recording and broadcast studios, (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) schools, colleges, hospitals, hotels and libraries, and (G5) offices and general commercial premises.
V1-V4	Type of receptor – (V1) vibration sensitive research and manufacturing, hospital, and university equipment, (V2) hotels, hospital wards and education dormitories, (V3) offices, schools and places of worship, (V4) workshops.
T	Receptor design – typical.
S	Receptor design – special.
H	Existing environment – high existing ambient noise levels, day >75dB, evening >65dB or night >55dB L_{pAeq} at the facade.
L	Existing environment – low existing ambient noise levels, day and evening ≤45dB, or night ≤35dB L_{pAeq} at the facade.
D,E,N	Impact duration (months) – duration of impact during the day (D), evening (E) or night (N).

Symbol	Explanation
O, CT, V	Combined Impact: If impacts from other construction activities occur at this location: Onsite activities (O), off-site construction traffic activities (CT), or construction Vibration (V).
NI	Mitigation effect – identified as likely to qualify for noise insulation under the draft Code of Construction Practice (CoCP)[5].
TR	Mitigation effect – identified as likely to qualify for temporary rehousing under the draft CoCP.

[5] HS2 Ltd (2017), High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement, *Draft Code of Construction Practice, Volume 5: Appendix CT-003-000*, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627182/E26_CT-003-000_WEB.pdf

Table 2: Assessment of construction noise at residential receptors (SES2 scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
11027	Rose Cottage, Riley Hill[6]	66/73 [A]	-	-	Day: Road construction	A	1	R	T	-	-	D7		-	~
11051	Pool Cottage, Riley Hill[6]	61/66 [A]	-	-	Day: ATS foundation	A	2	R	T	-	-	D3		-	~
11090	Pipe Ridware, Rugeley[6]	63/66 [A]	-	-	Day: Earthworks	A	1	R	T	-	-	D8		-	CSV01-C02
11115	Uttoxeter Road, Blithbury[6]	60/65 [A]	-	-	Day: On-site traffic	A	1	R	T	-	-	D1		-	~
11141	Stoneyford Farm, Blithbury[6]	61/66 [A]	-	-	Day: Overbridge pile breakdown	A	1	R	T	-	-	D5		-	~
11142	Oak Croft House, Blithbury[6]	59/65 [A]	-	-	Day: Overbridge pile breakdown	A	2	R	T	-	-	D1		-	~
11143	Blithbury Road, Rugeley[6]	62/68 [A]	-	-	Day: Overbridge pile breakdown	A	1	R	T	-	-	D6		-	CSV01-C03 -

[6] Change as a result of SES2 change: update to construction programme and changes to construction traffic flows on site haul routes.

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
11159	Sherracop, Stockwell Heath[6] (CD ref: 17/01412/COU)	63/69 [A]	-	-	Day: Overbridge Pile breakdown	A	4	CD-R	T	-	-	D6		-	CSV01-C04
11167	Narrow Lane, Rugeley[6]	65/70 [A]	-	-	Day: Overbridge pile breakdown	A	1	R	T	-	-	D13		-	~
11240	Hadley Gate Farm (CD ref: 16/00753/PND)[6]	74/79 [A]	-	-	Day: Demolition	S	1	R	T	-	-	D11		NI	~
11241	Wayside, Stockwell Heath (CD ref: 18/00342/COU, 17/00201/COU)	56/61 [A]	-	-	Day Overbridge Pile breakdown	NA	4	CD-R	T	-	-	-	-	-	

Table 3: Assessment of construction noise at non-residential receptors (SES2 scheme)

Assessment location		Impact criteria					Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
8001(N)	Alrewas Hayes Countryside Venue, Alrewas (SES2 only)[6]	54/58	-	10	-	Day: Haul road construction	B	1	G4	T	-	-	D31	-	-	[7]
8001(N)	Alrewas Hayes Countryside Venue, Alrewas (SES2 & AP1)	56/60	-	12	-	Day: Haul road construction and utilities	B	1	G4	T	-	-	D36	-	-	[7]
8014(N)	Rookery Lodge Boarding Kennels & Cattery (SES2 only)[6]	66/70	-	13	-	Day: Road construction	B	1	G5	T	-	-	D32	-	-	CSV01-N01
8014(N)	Rookery Lodge Boarding Kennels & Cattery (SES2 & AP1)	66/71	-	14	-	Day: Road construction	B	1	G5	T	-	-	D33	-	-	CSV01-N01
11008(N)	Kingfisher Holiday Park, Fradley Junction (SES2 only)[6]	51/56	-	7	-	Day: Earthworks	B	1	G4	T	-	-	D17	-	-	[7]

[7] The predicted airborne construction sound levels at the assessment location is greater that the screening criteria for this building type. Where predicted levels are greater than the screening criteria this triggers a requirement to undertake a more detailed assessment of local factors. In this situation the ground between the construction works and the receptor is acoustically 'soft' whereas the assessment considers 'hard' ground only. Taking the ground condition into consideration reduces the predicted levels at the receptor to a level below the screening value.

Assessment location		Impact criteria					Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
11008(N)	Kingfisher Holiday Park, Fradley Junction (SES2 & AP1)	52/57	-	8	-	Day: Earthworks	B	1	G4	T	-	-	D19	-	-	[7]
11034(N)	The Richard Crosse, Church of England Primary School (SES2 only)[6]	54/59	-	10	-	Day: Borrow pit excavation	B	1	G4	T	-	-	D33	-	-	[7]
11034(N)	The Richard Crosse, Church of England Primary School (SES2 & AP1)	55/60	-	11	-	Day: Borrow pit excavation	B	1	G4	T	-	-	D34	-	-	[7]
11080(N)	Four Seasons Nature Study Centre[6]	60/64	-	10	-	Day: Earthworks	B	1	G3	T	-	-	D55	-	-	CSV01-No2
11089(N)	Ridware Theatre, Pipe Ridware[6]	66/69	-	14	-	Day: Earthworks	B	1	G3	T	-	-	D 29	-	-	CSV01-No3
11166(N)	Rugeley Rescue Centre: Border Collie Trust, Colton[6]	68/72	-	29	-	Day: Viaduct construction	B	1	G5	T	-	-	D 26	-	-	CSV01-No5

Assessment location		Impact criteria					Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
11231(N)	Woodhouse Farm, Pipe Lane, Pipe Ridware (CD Ref: 14/00614/FUL)[6, 8]	61/65	-	24	-	Day: Earthworks	B	7	G4	T	-	-	D41	-	-	CSV01-N04
25103(N)	Henry Chadwick Primary School, Pipe Ridware[6]	54/58	-	14	-	Day: Earthworks	B	1	G4	T	-	-	D 23	-	-	[7]

[8] Change as a result of SES2 change: provision of a noise bund near Woodhouse Farm (SES2-001-005).

Airborne sound: indirect impacts and effects

2.1.7 Construction road traffic associated with the construction phases of the SES2 scheme and AP2 amendments would generate airborne noise. Given that the construction traffic model information is not available for the SES2 changes and AP2 amendments separately, the in-combination effects of SES2 changes and AP2 amendments is presented in the SES2 section. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. Data has been produced for a typical month during the construction period and for a worst-case month during the construction period. The results for potentially significant road links are presented in Table 4.

2.1.8 Explanation of the information within Table 4 is provided in in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 4: Assessment of construction traffic noise levels – indirect effects (SES2 scheme and AP2 revised scheme)

Road name	Portion of road affected	Number of dwellings (approx.)	Daytime traffic sound levels, LpA10, 18 hr dB			Change compared to current traffic sound level (dB)		Combined impact	Significant effect
			Without HS2 (2017)	Typical month during construction	Peak month during construction	Typical month during construction	Peak month during construction		
Blithbury Road / Hollow Lane	Between the junction with Uttoxeter Road in Blithbury and the junction with Bellamour Way and High Street in Colton.	40	57	58	59	1	2	-	

Effects arising during operation

Introduction

2.1.9 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Fradley to Colton Community area report.

Avoidance and mitigation measures

2.1.10 The avoidance and mitigation measures are set out in the main ES Volume 2, Fradley to Colton Community area report, Section 13.

2.1.11 In addition to this mitigation, the noise fence barrier located on the Kings Bromley viaduct has been amended such that for the new alignment the noise fence barrier height above rail, defined in the main ES is maintained, and a new noise earthwork bund is included within the SES2 scheme close to Woodhouse Farm.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.1.12 The SES2 changes do not change the likely significant effects identified in the main ES.

Airborne sound: direct impacts and effects

2.1.13 The direct effects from the operation of the SES2 scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the SES2 scheme, have been assessed.

2.1.14 Volume 5: Appendix SV-001-000 of the main ES, with the additional information in Table 5, provides an explanation of the information in Table 6. The assessment information, impact criteria and significance criteria for incorporated mitigation at residential receptors are presented in Table 6. No non-residential receptors are affected by the SES2 scheme.

2.1.15 The principal SES2 changes responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnotes. The results should be considered in conjunction with the information contained in the main ES and the SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02.

Table 5: Explanatory notes for operational assessment results

Symbol	Explanation
	Where the significant effect column is marked, then a significant effect is identified at the referenced group of dwellings, or individual residential or non-residential receptor.
	Yellow denotes a minor impact at a residential building – a change is of 3-5dB.
	Orange denotes a moderate impact at a residential building – a change is of 5-10dB.
	Red denotes a major impact at a residential building – a change is of >10dB.
*	Day– $L_{pAeq,07:00-23:00.}$
**	Night– $L_{pAeq,23:00-07:00.}$
***	Max– $L_{pAFmax.}$ In the "SES2 scheme only" or "AP2 revised scheme only" columns, two values are presented. The first is the value for the HS2 mitigated train and the second is the value for the TSI compliant train. For further information, refer to Volume 5: Appendix SV-001-000 of the main ES.
****	Where the SES2 scheme or AP2 revised scheme modifies an existing source, i.e. road or railway realignments, the *"SES2 scheme only" or "AP2 revised scheme only"* and *(Opening year baseline + Year 15 traffic)* levels in the table include the sound from the modified source.
A	Sound levels from HS2 exceed Lowest Observed Adverse Effect Level (LOAEL): the significance criteria set out in Appendix SV-001-000 of the main ES, Annex A, Section 1.3 are considered when establishing significant effects.
B	For non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000 of the main ES.
CD	Committed Development. The 'Area represented' column contains information about the potential number of impacts included in the development.
G	(G1) Theatres, large auditoria and concert halls, (G2) Sound recording and broadcast studios, (G3) Places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls, (G4) Schools, colleges, hospitals, hotels and libraries, and (G5) Offices and general commercial premises.
H	High existing ambient sound level. Defined as >65dB$L_{Aeq,\ day}$ and/or >55dB$L_{Aeq,\ night.}$
L	Low existing ambient sound level. Defined as <42dB$L_{Aeq,\ day}$ and/or <32dB$L_{Aeq,\ night.}$
LD	Landscape receptor.
NA	Sound levels from HS2 do not exceed Lowest Observed Adverse Effect Level (LOAEL), therefore generally no adverse effect.
NI	The receptor is predicted to qualify for mitigation, which shall be provided to the specification defined in the Noise Insulation (Railways and other Guided Rail Systems) Regulations 1996.
R	Residential receptor.
RM	Residential mooring.

Symbol	Explanation
S	Sound levels from HS2 exceed Significant Observed Adverse Effect Level (SOAEL): noise insulation therefore provided.
#	A change of 3dB or greater has been identified however, the assessment methodology only defines an impact where the absolute sound level from the AP2 revised scheme is greater or equal to 50dB $L_{pAeq,\ 07:00-23:00}$ during the daytime or 40dB $L_{pAeq,\ 23:00\ -\ 07:00}$ at night. At the receptor denoted the absolute level condition is not met and therefore no impact is identified.
~	When considered under the significance criteria set out in Annex A, Section 1.3 Volume 5: Appendix SV-001-000 of the main ES, these adverse effects are not considered to be significant on a community basis.
$	A change of 3dB or greater has been identified however, the impact methodology for non-residential receptors includes a screening criteria for G3 building use of 50dB $L_{pAeq,07:00-23:00}$, for G4 building use 55dB $L_{pAeq,07:00-23:00}$ and 45dB $L_{pAeq,23:00-07:00}$, for G5 building use 55dB $L_{pAeq,07:00-23:00}$. At the receptor denoted the screening criteria is not met and therefore no impact is identified. Further information is provided in Volume 5: Appendix SV-001-000 of the main ES.

Table 6: Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
11012	Crawley Lane, Kings Bromley[9]	50	40	64/66	42	36	47	50	41	8	5	A	1	R	T	-	-	-	-	OSV01-C01
11018	Crawley Lane, Kings Bromley[9]	50	40	65/66	42	36	47	50	42	8	6	A	7	R	T	-	-	-	-	OSV01-C01
11027	Barn Farm, Common Lane, Rileyhill[9]	71	61	87/88	46	43	50	71	61	25	18	S	1	R	T	-	-	-	NI	OSV01-C01/ OSV01-D01
11028	Crawley Lane, Kings Bromley[9]	50	40	67/68	42	36	47	50	41	8	5	A	1	R	T	-	-	-	-	OSV01-C01
11037	Lichfield Road, Kings Bromley[9]	44	34	60/61	55	53	58	55	53	0	0	A	13	R	T	-	-	-	-	
11040	Rose Cottage, Rileyhill[9]	60	50	77/78	46	43	50	60	51	14	8	A	1	R	T	-	-	-	-	OSV01-C01
11042	Common Farm, Rileyhill[9]	57	48	73/74	46	43	50	58	49	12	6	A	2	R	T	-	-	-	-	OSV01-C01

[9] Change as a result of SES2 change: lowering of Kings Bromley viaduct, Bourne embankment and River Trent viaduct (SES2-001-003).

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
11043	Holly Cottage, Rileyhill[9]	59	49	76/77	46	43	50	59	50	13	7	A	1	R	T	-	-	-	-	OSV01-C01
11048	Manor Walk, Kings Bromley[9]	42	32	55/57	36	34	58	43	36	7	2	NA	4	R	T	-	-	-	-	
11059	Manor Park, Kings Bromley[9]	49	40	63/64	40	35	48	50	41	10	6	A	3	R	T	-	-	-	-	#
11064	Shawlane Farm, Shaw Lane, Kings Bromley[9]	63	53	82/83	49	39	50	63	54	14	15	S	1	R	T	-	-	-	NI	OSV01-C01/ OSV01-D02
11068	Echills Farm, Rugeley Road, Kings Bromley[9]	64	55	80/81	50	38	49	65	55	15	17	S	1	R	T	-	-	-	NI	OSV01-D03
11071	Nethertown, Rugeley[9]	49	40	62/63	47	38	51	51	42	4	4	A	4	R	T	-	-	-	-	~
11083	Kings Bromley Lane, Rugeley[9]	54	44	66/67	48	41	61	55	46	7	5	A	1	R	T	-	-	-	-	~
11093	Goldhayfields Farm, Blithbury[9]	50	40	65/67	43	28	47	51	40	8	12	A	3	R	T	-	-	-	-	~

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
11099	Luthbur, Pipe Ridware, Rugeley[9]	64	54	79/80	46	40	52	64	54	18	14	S	1	s	T	-	-	-	NI	OSV01-C03/ OSV01-D04
11103	The Bungalow and Woodhouse Farm, Blithbury[9]	57	47	72/74	38	31	41	57	47	19	16	S	2	R	T	-	-	-	NI	OSV01-C07
11231	Woodhouse Farm, Pipe Lane, Pipe Ridware (CD Ref: 14/00614/FUL)[10]	56	46	69/71	38	31	41	56	46	18	15	S	7	CD -R	T	-	-	-	-	OSV01-C07
11241	Wayside, Stockwell Heath (CD ref: 18/00342/COU, 17/00201/COU)	52	42	72/73	42	36	47	52	43	10	7	S	4	CD -R	T	-	-	-	-	OSV01-C06

[10] Change as a result of SES2 changes: provision of a noise bund near Woodhouse Farm (SES2-001-005).

Airborne sound: indirect impacts and effects

2.1.16 There is no material change in the airborne sound indirect effects compared to the original scheme or SES1 scheme as a result of the SES2 scheme listed in Section 1.3.2.

Airborne sound levels used in other assessments

2.1.17 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or SES1 scheme as a result of the SES2 scheme listed in Section 1.3.2.

2.2 Part 2: Additional Provision 2 Environmental Statement

Effects during construction

2.2.1 There is no material change in construction sound, noise and vibration compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Effects arising during operation

Introduction

2.2.2 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Fradley to Colton Community area report.

Avoidance and mitigation measures

2.2.3 The avoidance and mitigation measures are set out in the main ES Volume 2, Fradley to Colton Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

2.2.4 There is no change in the ground-borne noise and vibration impacts compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

2.2.5 The direct effects from the operation of the AP2 revised scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the AP2 revised scheme, have been assessed. The assessment information, impact criteria and significance criteria for the incorporated mitigation at residential and non-residential receptors are presented in Table 7. No non-residential receptors are affected by the AP2 revised scheme.

2.2.6 The results should be considered in conjunction with the information contained in the main ES and SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02. Explanation of the information in Table 7 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES. The principal AP2 amendment responsible for the change in operational airborne noise effect at the specific assessment locations reported in the following table, is identified in the associated footnote.

Table 7: Operational airborne sound, noise impacts and significant effects: residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
277	Lysways Lane, Hanch[11]	39	30	58/-	45	34	53	46	35	1	1	NA	2	R	T	-	-	-	-	
572	Lichfield Road, Armitage[12]	38	29	56/-	42	33	52	43	34	1	1	NA	2	R	T	L	-	-	-	
623	Tuppenhurst Lane, Rugeley[12]	58	48	79/-	54	48	54	59	51	5	3	A	3	R	T	-	-	-	-	~
642	Lichfield Road, King's Bromley[12]	47	38	65/-	57	38	60	57	41	0	3	A	2	R	T	-	-	-	-	
746	Tuppenhurst Lane, Rugeley[12]	49	40	65/-	50	34	51	52	41	2	7	A	1	R	T	-	-	-	-	~
18106	Wood End Lane, Elmhurst[12]	50	41	67/-	54	41	53	56	44	2	3	A	4	R	T	-	-	-	-	
19720	Lichfield Road, Hanch[12]	41	32	58/-	59	42	61	59	42	0	0	A	10	R	T	-	-	-	-	

[11] Change as a result of amendment: additional land and a change to Bill powers required to make alterations to the Handsacre Junction connection into the West Coast Main Line (AP2-001-001).
[12] Change as a result of SES2 changes: update to construction programme and changes to construction traffic flows on site haul routes.

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
19867	Lichfield Road, Hanch[12]	44	35	63/-	51	40	62	52	41	1	1	A	1	R	T	-	-	-	-	
20009	Lichfield Road, Hanch[12]	43	34	59/-	57	40	61	57	41	0	1	A	1	R	T	-	-	-	-	
20044	Shaw Lane, Hanch[12]	44	34	63/-	56	45	67	56	45	0	0	A	1	R	T	-	-	-	-	
20090	Shaw Lane, Hanch[12]	52	43	72/-	53	37	51	56	44	3	7	A	2	R	T	-	-	-	-	~
20124	Lysways Lane, Hanch[12]	41	32	60/-	49	38	57	50	39	1	1	A	1	R	T	-	-	-	-	
25097	Shaw Lane, Bromley Hayes[12]	39	30	54/-	47	34	44	48	35	1	1	NA	1	R	T	-	-	-	-	

Airborne sound: indirect impacts and effects

2.2.7 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 revised scheme listed in Section 1.3.4.

Airborne sound levels used in other assessments

2.2.8 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 revised scheme listed in Section 1.3.4.

3 Colwich to Yarlet (CA2)

3.1 Part 1: Supplementary Environmental Statement 2

Effects during construction

3.1.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Colwich to Yarlet Community area report.

Avoidance and mitigation measures

3.1.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Colwich to Yarlet Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

3.1.3 The SES2 changes do not change the likely significant effects identified in the main ES or SES1.

Airborne sound: direct impacts and effects

3.1.4 Activities associated with the construction phases of the SES2 scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

3.1.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. Where the assessment identifies receptors subject to change in effect and therefore a potential new or different likely significant effect, the assessment results, impact criteria and significance criteria for the assessment of the SES2 scheme at residential and non-residential receptors are presented in Table 8 and Table 9 respectively.

3.1.6 The principal SES2 changes responsible for the change in construction noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnotes. Explanation of the information within Table 8 and Table 9 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 8: Assessment of construction noise at residential receptors (SES2 scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
12134	Kings Drive, Hopton[12]	59/65 [A]	-	-	Day: Underground utility diversion	A	5	R	T	-	-	D1	-	-	CSV02-C04
12142	Lower Lane, Hopton[13]	63/67 [A]	-	-	Day: Haul road construction	A	5	R	T	-	-	D8	-	-	CSV02-C04
12146	Lower Lane, Hopton[13]	61/65 [A]	-	-	Day: Underground utility diversion	A	1	R	T	-	-	D3	-	-	CSV02-C04
12148	Wilmore Hill Lane, Hopton[13]	60/65 [A]	-	-	Day: Underground utility diversion	A	5	R	T	-	-	D3	-	-	CSV02-C04
12152	Wilmore Hill Lane, Hopton[13]	59/65 [A]	-	-	Day: Underground utility diversion	A	2	R	T	-	-	D1	-	-	CSV02-C04
12153	Wilmore Hill Lane, Hopton[13]	64/71 [A]	-	-	Day: Underground utility diversion	A	1	R	T	-	-	D7	-	-	CSV02-C04

[13] Change as a result of SES2 changes: provision of a new underground Openreach telecommunications cable to the Sandon Road auto-transformer satellite compound (SES2-002-101).

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
12158	Bank Top House, Hopton[13]	76/78 [A]	-	-	Day: Underground utility diversion	A	1	R	T	-	-	D13	-	-	CSV02-C04
12164	Mount Edge, Hopton[13]	66/72 [A]	-	-	Day: Demolition	A	3	R	T	-	-	D21	-	-	CSV02-C04

Table 9: Assessment of construction noise at non-residential receptors (SES2 scheme)

Assessment location		Impact criteria					Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
12092(N)	St Mary the Virgin Church, Ingestre[14]	52/58	-	12	-	Day: Earthworks and bridge construction	B	1	G3	T	-	-	D5	-	-	[7]
12093(N)	Ingestre Hall, Ingestre[14]	52/58	-	12	-	Day: Earthworks and bridge construction	B	1	G4	T	-	-	D8	-	-	[7]
12209(N)	Yarlet School, Main Building (SES2 only)[14]	58/62	-	11	-	Day: Underground utilities	B	1	G4	T	-	-	D6	-	-	CSV04-N04
12209(N)	Yarlet School, Main Building (SES2 & AP1)[15]	59/65	-	14	-	Day: Underground utilities	B	1	G4	T	-	-	D7	-	-	CSV04-N04

[14] Change as a result of SES2 change: update to construction programme and changes to construction traffic flows on site haul routes.
[15] Change as a result of SES2 change: update to construction programme and changes to construction traffic flows on site haul routes and AP1 change: Cadent 90mm low pressure gas main.

Airborne sound: indirect impacts and effects

3.1.7 Construction road traffic associated with the construction phases of the SES2 scheme and AP2 amendments would generate airborne noise. Given that the construction traffic model information is not available for the SES2 changes and AP2 amendments separately, the in-combination effects of SES2 changes and AP2 amendments is presented in the SES2 section. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. Data has been produced for a typical month during the construction period and for a worst-case month during the construction period. The results for potentially significant road links are presented in Table 10.

3.1.8 Explanation of the information within Table 10 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 10: Assessment of construction traffic noise levels – indirect effects (SES2 scheme and AP2 revised scheme)

Road name	Portion of road affected	Number of dwellings (approx.)	Daytime traffic sound levels, $L_{pA10,\ 18\ hr}$ dB			Change compared to current traffic sound level (dB)		Combined impact	Significant effect
			Without HS2 (2017)	Typical month during construction	Peak month during construction	Typical month during construction	Peak month during construction		
Marston Lane[14]	From the junction with the A5613 past Marston Farm to the turning near Marston Cottages	11	46	48	51	1	4	-	-

Effects arising during operation

Introduction

3.1.9 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Colwich to Yarlet Community area report.

Avoidance and mitigation measures

3.1.10 The avoidance and mitigation measures are set out in the main ES Volume 2, Colwich to Yarlet Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

3.1.11 There is no material change in the ground-borne noise and vibration impacts compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

3.1.12 The direct effects from the operation of the SES2 scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the SES2 scheme, have been assessed. The assessment information, impact criteria and significance criteria for the assessment of the incorporated mitigation at residential and non-residential receptors are presented in Table 11 and Table 12.

3.1.13 The principal SES2 change responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

3.1.14 The results should be considered in conjunction with the information contained in the main ES and SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02. Explanation of the information in Table 11 and Table 12 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES.

Table 11: Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
12001	Upper Moreton Farm, Moreton[16]	49	39	62/63	42	34	49	50	40	8	6	A	1	R	T	-	-	-	-	#
12004	Moreton Grange, Bishton Lane, Moreton[16]	60	51	77/78	44	35	49	60	51	16	16	S	3	R	T	-	-	-	NI	OSV02-C01/ OSV02-D01

Table 12: Operational airborne sound, noise impacts and significant effects: non-residential receptors (SES2 scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
12002(N)	Upper Moreton Farm and Education Centre[16]	50	40	64/62	42	34	49	50	41	8	7	B	1	G4	T	-	-	-	-	

[16] Change as a result of SES2 change: Extension of a noise fence barrier from Moreton North embankment to Moreton South embankment (SES2-002-001).

Airborne sound: indirect impacts and effects

3.1.15 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the SES2 changes listed in Section 1.3.3.

Airborne sound levels used in other assessments

3.1.16 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the SES2 changes listed in Section 1.3.3.

3.2 Part 2: Additional Provision 2 Environmental Statement

Effects arising during construction

Introduction

3.2.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Colwich to Yarlet Community area report.

Avoidance and mitigation measures

3.2.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Colwich to Yarlet Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

3.2.3 There is no material change in the ground-borne vibration effects compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

3.2.4 Activities associated with the construction phases of the AP2 revised scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

3.2.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. The assessment results, impact criteria and significance criteria for the assessment of the AP2 revised scheme at residential and non-residential receptors are presented in Table 13 and Table 14 respectively.

3.2.6 Explanation of the information within Table 13 and Table 14 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

3.2.7 The principal AP2 amendments responsible for the change in construction noise effect at the specific assessment locations reported in the following tables, are identified in the associated footnotes.

Table 13: Assessment of construction noise at residential receptors (AP2 revised scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
11109	Applelawn, Blithbury[18]	68/70 [A]	-	-	Day: Construction of new accommodation at Rugeley School	A	1	R	T	-	-	D2	-	-	~
12064	Hoo Mill Lane, Great Haywood[17]	60/67 [A]	-	-	Day: Demolitions	A	1	R	T	-	-	D1	-	-	~
12071	Lion Lodge, Ingestre[17]	60/66 [A]	-	-	Day: Underground utility diversion	A	2	R	T	-	-	D2	-	-	~
12167	Mount Edge, Hopton[18]	59/64 [A]	-	-	Day: Earthworks	A	3	R	T	-	-	D1	-	-	CSV02-C04
12168	Spode Avenue, Stafford[18]	59/65 [A]	-	-	Day: Earthworks and road construction	A	6	R	T	-	-	D3	-	-	CSV02-C04

[17] Change as a result of amendment: additional land and a change to Bill powers required for the diversion of a National Grid gas pipeline and a new utility compound, north-west of Great Haywood Marina (AP2-002-009).
[18] Change as a result of amendment: additional land and a change to Bill powers required for the realignment of the B5066 Sandon Road, diversion of Hopton Lane, extension of Hopton Lane and increased non-motorised user provision across the HS2 route between Hopton and Mount Edge (AP2-002-019), additional land required for construction activities around B5066 Sandon Road, Hopton (AP2-002-020) and additional land and a change to Bill powers for the underground diversion of Western Power Distribution 11kV overhead line, west of the B5066 Sandon Road (AP2-002-112).

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
12170	Spode Avenue, Stafford[18]	60/66[A]	-	-	Day: Earthworks and road construction	A	8	R	T	-	-	D6	-	-	CSV02-C04
12171	Sandon Road, Hopton[19]	60/66 [A]	-	-	Day: Underground utility diversion	A	1	R	T	-	-	D2	-	-	~
12251	Green Lane / Nursery Lane, Great Haywood[20]	60/65 [A]	-	-	Day: Underground utility diversion	A	27	R	T	-	-	D2	-	-	CSV02-C07

[19] Change as a result of amendment: additional land and a change to Bill powers for the underground diversion of Western Power Distribution 11kV overhead line, west of the B5066 Sandon Road (AP2-002-112).
[20] Change as a result of amendment: change to Bill powers required for the diversion of a British Pipeline Agency fuel pipeline and a new utility compound, A51 Lichfield Road (AP2-002-007).

Table 14 Assessment of construction noise at non-residential receptors (AP2 revised scheme)

Assessment location		Impact criteria					Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
12008(N)	The Mayfield Children's home (Residential children's home)[21]	59/63	-	20	-	Day: Earthworks	B	1	G4	T	-	-	D9			CSV02-N02
12008(N)	The Mayfield Children's home (Residential children's home)[22]	59/63	-	20	-	Day: Earthworks	B	1	G4	T	-	-	D36			CSV02-N02
11107(N)	Priory School, Rugeley[21]	64/66	-	26	-	Day: Construction of new accommodation at Rugeley School	B	1	G4	T	-	-	D 2			CSV02-N04
12235 (N)	Ingestre Golf Course clubhouse[23]	61/66	-	23	-	Day: Earthworks and flood compensation	B	1	G5	T	-	-				*

[21] Change as a result of amendment: additional land required for the provision of a replacement facility for Mayfield Children's Home (AP2-002-001).
[22] Change as a result of amendment: additional land and a change to Bill powers required for the removal of Moreton retaining wall and to realign the access track to Moreton House and Moreton House Farm (AP2-002-002).
[23] Change as a result of amendment: additional land permanently required for the reconfiguration of Ingestre Park Golf Club (AP2-002-010).

Airborne sound: indirect effects

3.2.8 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

3.2.9 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Effects arising during operation

Introduction

3.2.10 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Colwich to Yarlet Community area report.

Avoidance and mitigation measures

3.2.11 The avoidance and mitigation measures are set out in main ES Volume 2, Colwich to Yarlet Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

3.2.12 There is no material change in the ground-borne vibration effects compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

3.2.13 The direct effects from the operation of the AP2 revised scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the AP2 revised scheme, have been assessed. The assessment information, impact criteria and significance criteria for the incorporated mitigation at residential and non-residential receptors are presented in Table 15 and Table 16.

3.2.14 The principal AP2 amendments responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnotes.

3.2.15 The results should be considered in conjunction with the information contained in the main ES and SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02. Explanation of the information in Table 15 and Table 16 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES.

Table 15: Operational airborne sound, noise impacts and significant effects: residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
12003	Bishton Lane, Wolseley Bridge[24]	53	43	69/70	44	34	43	53	44	9	10	A	1	R	T	-	-	-	-	OSV02-C01
12005	Bishton Lane, Wolseley Bridge[24]	52	42	70/71	40	33	45	52	43	12	10	A	4	R	T	-	-	-	-	OSV02-C01
12008	Moreton House, Moreton[24, 25]	59	49	74/75	40	33	45	59	49	19	16	A	1	R	T	-	-	-	-	OSV02-C01
12290	Rosemary Cottage, Moreton[24]	63	54	83/84	44	34	43	63	54	19	20	S	1	R	T	-	-	-	NI	OSV02-C01/ OSV02-D02

[24] Change as a result of amendment: additional land and a change to Bill powers required for the removal of Moreton retaining wall and to realign the access track to Moreton House and Moreton House Farm (AP2-002-002).
[25] Change as a result of amendment: additional land required for the provision of a replacement facility for Mayfield Children's Home (AP2-002-001).

Table 16: Operational airborne sound, noise impacts and significant effects: non-residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
12235(N)	Ingestre Golf Course clubhouse[26]	52	42	67/68	43	35	47	53	42	10	8	NA	1	G5	T	-	-	-	-	$

[26] Change as a result of amendment: additional land permanently required for the reconfiguration of Ingestre Park Golf Club (AP2-002-010).

Airborne sound: indirect impacts and effects

3.2.16 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

3.2.17 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.5.

4 Stone and Swynnerton (CA3)

4.1 Part 1: Supplementary Environmental Statement 2

Effects during construction

4.1.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Stone and Swynnerton Community area report.

Avoidance and mitigation measures

4.1.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Stone and Swynnerton Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

4.1.3 The SES2 changes do not change the likely significant effects identified in the main ES or SES1.

Airborne sound: direct impacts and effects

4.1.4 The SES2 changes do not change the likely significant effects identified in the main ES or SES1.

Airborne sound: indirect impacts and effects

4.1.5 Construction road traffic associated with the construction phases of the SES2 scheme and AP2 amendments would generate airborne noise. Given that the construction traffic model information is not available for the SES2 changes and AP2 amendments separately, the in-combination effects of SES2 changes and AP2 amendments is presented in the SES2 section. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. Data has been produced for a typical month during the construction period and for a worst-case month during the construction period. The results for potentially significant road links are presented in Table 17.

4.1.6 Explanation of the information within Table 17 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 17: Assessment of construction traffic noise levels – indirect effects (SES2 scheme and AP2 revised scheme)

Road name	Portion of road affected	Number of dwellings (approx.)	Daytime traffic sound levels, LpA10, 18 hr dB			Change compared to current traffic sound level (dB)		Combined impact	Significant effect
			Without HS2 (2017)	Typical month during construction	Peak month during construction	Typical month during construction	Peak month during construction		
Pirehill Lane / Green Lane	From the junction with Whitgreave Lane in Whitgreave to the main body of Walton	45	44	48	53	3	9	-	CSV02-C06 / CSV03-C01

Effects arising during operation

4.1.7 There is no material change in the operational sound, noise and vibration compared to the main ES or SES1.

4.2 Part 2: Additional Provision 2 Environmental Statement

Effects during construction

Introduction

4.2.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Stone and Swynnerton Community area report.

Avoidance and mitigation measures

4.2.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Stone and Swynnerton Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

4.2.3 There is no change in the ground-borne vibration effects compared to the main ES or where relevant the SES1 or SES2.

Airborne sound: direct impacts and effects

4.2.4 Activities associated with the construction phases of the AP2 revised scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

4.2.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area.

4.2.6 The assessment results, impact criteria and significance criteria for the assessment of the SES2 scheme at residential receptors are presented in Table 18. No non-residential receptors are materially affected by the AP2 amendments.

4.2.7 The principal AP2 amendments responsible for the change in construction noise effect at the specific assessment locations reported in the following tables, are identified in the associated footnotes. Explanation of the information within Table 18 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 18: Assessment of construction noise at residential receptors (AP2 amendments)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
13037	Pirehill Lane, Stone[27]	68/74 [A]	-	-	Day: Underground utility works	A	1	R	T	-	-	D4	-	-	~
13150	Cliffords Wood, Swynnerton[28]	59/65 [A]	-	-	Day: Haul road use	A	1	R	T	-	-	D1	-	-	~
13151	Cliffords Wood, Swynnerton[28]	60/66 [A]	-	-	Day: Earthworks	A	2	R	T	-	-	D4	-	-	~
25100	Newcastle Road, Hanchurch[29]	67/68 [B]	-	-	Day: Road works	A	7	R	T	H	-	-	-	-	
25101	Newcastle Road, Hanchurch[29]	68/68 [B]	-	-	Day: Road works	A	5	R	T	H	-	-	-	-	
25102	Newcastle Road, Hanchurch[29]	68/69 [B]	-	-	Day: Road works	A	5	R	T	H	-	-	-	-	

[27] Change as a result of amendment: additional land for the permanent underground diversion of a Western Power Distribution 11kV overhead line near North Pirehill Farm (AP2-003-102).
[28] Change as a result of amendment: additional land for the permanent diversion of three Severn Trent Water water mains supplies near the A51 Stone Road and Stab Lane (AP2-003-112).
[29] Change as a result of amendment: additional land permanently required for modifications to the roundabout junction of the A500 Queensway/A519 Newcastle Road/Clayton Road (Hanchurch Interchange) and the signalised crossroads junction of the A519 Newcastle Road/A5182 Trentham Road/B5038 Whitmore Road and a new temporary satellite construction compound (AP2-003-017).

Airborne sound: indirect effects

4.2.8 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

4.2.9 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Effects arising during operation

Introduction

4.2.10 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Stone and Swynnerton Community area report.

Avoidance and mitigation measures

4.2.11 The avoidance and mitigation measures are set out in the main ES Volume 2, Stone and Swynnerton Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

4.2.12 There is no material change in the ground-borne noise and vibration impacts compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

4.2.13 The direct effects from the operation of the SES2 scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the SES2 scheme, have been assessed. The assessment information, impact criteria and significance criteria for the assessment of the incorporated mitigation at residential receptors are presented in Table 19. No non-residential receptors are affected by this change.

4.2.14 The principal AP2 amendment responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

4.2.15 The results should be considered in conjunction with the information contained in the main ES and SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02. Explanation of the information in Table 19 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES.

Table 19: Operational airborne sound, noise impacts and significant effects: residential receptors (AP2 revised scheme)

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
25100	Newcastle Road, Hanchurch[29, 30]	67	60	-	67	60	82	67	60	0	0	NA	7	R	T	H	-	-	-	
25101	Newcastle Road, Hanchurch[29, 30]	67	60	-	67	60	81	67	60	0	0	NA	5	R	T	H	-	-	-	
25102	Newcastle Road, Hanchurch[29, 30]	66	60	-	66	60	81	66	60	0	0	NA	5	R	T	H	-	-	-	

[30] For the purpose of the assessment it has been assumed that the dominant noise source at this location is the A519 Newcastle Road. The amendment does not alter the noise level associated with this source.

Airborne sound: indirect impacts and effects

4.2.16 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

4.2.17 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

5 Whitmore Heath to Madeley (CA4)

5.1 Part 1: Supplementary Environmental Statement 2

Effects during construction

5.1.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Whitmore Heath to Madeley Community area report.

Avoidance and mitigation measures

5.1.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Whitmore Heath to Madeley Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

5.1.3 The SES2 changes do not change the likely significant effects identified in the main ES.

Airborne sound: direct impacts and effects

5.1.4 Activities associated with the construction phases of the SES2 scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

5.1.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. The assessment results, impact criteria and significance criteria for the assessment of the SES2 scheme at residential receptors are presented in Table 20.

5.1.6 The principal SES2 change responsible for the change in construction noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote. Explanation of the information within Table 20 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 20: Assessment of construction noise at residential receptors (SES2 scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
14208	Granary Cottage, Snape Hall Road, Whitmore Heath[31]	63/66 [A]	<45	33/38 [B]	Day: Earthworks Night: Tunnelling / tunnelling support	A	1	R	T	-	-	D11	-	-	~

[31] Change as a result of SES2 change: updates to construction programme and changes to construction traffic flows on site haul routes.

Airborne sound: indirect impacts and effects

5.1.7 Construction road traffic associated with the construction phases of the SES2 scheme and AP2 amendments would generate airborne noise. Given that the construction traffic model information is not available for the SES2 changes and AP2 amendments separately, the in-combination effects of SES2 changes and AP2 amendments is presented in the SES2 section. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. Data has been produced for a typical month during the construction period and for a worst-case month during the construction period. The results for potentially significant road links are presented in Table 17.

5.1.8 Explanation of the information within Table 21 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 21: Assessment of construction traffic noise levels – indirect effects (SES2 scheme and AP2 revised scheme)

Road name	Portion of road affected	Number of dwellings (approx.)	Daytime traffic sound levels, $L_{pA10,\ 18\ hr}$ dB			Change compared to current traffic sound level (dB)		Combined impact	Significant effect
			Without HS2 (2017)	Typical month during construction	Peak month during construction	Typical month during construction	Peak month during construction		
Bent Lane	From the junction with the A51 at Stableford Bridge to the junction with the A53 in Whitmore	10	53	55	56	2	3	-	
Snape Hall Road	From the junction with the A53 along the west of Whitmore Heath to the proposed Whitmore tunnel north portal	25	39	39	39	0	0	-	
Bar Hill Road (A525)	From the proposed Madeley tunnel southern portal to the junction with Manor Road next to the WCML	40	62	63	64	1	2	-	

Effects arising during operation

5.1.9 There is no material change in the operational sound, noise and vibration compared to the main ES or SES1

5.2 Part 2: Additional Provision 2 Environmental Statement

Effects during construction

Introduction

5.2.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Whitmore Heath to Madeley Community area report.

Avoidance and mitigation measures

5.2.2 The avoidance and mitigation measures are set out in the main ES Volume 2, Whitmore Heath to Madeley Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

5.2.3 There is no material change in the ground-borne vibration effects compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

5.2.4 Activities associated with the construction phases of the AP2 revised scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

5.2.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. The assessment results, impact criteria and significance criteria for the assessment of the AP2 revised scheme at residential and non-residential receptors are presented in Table 22. Explanation of the information within Table 22 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

5.2.6 The principal AP2 amendments responsible for the change in construction noise effect at the specific assessment locations reported in the following tables, are identified in the associated footnotes.

Table 22: Assessment of construction noise at residential receptors (AP2 revised scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
14033	The Old Rectory, Whitmore[32]	61/67 [A]	47/49 [A]	47/49 [B]	Day: Earthworks Eve: Tunnelling / tunnelling support Night: Tunnelling / tunnelling support	A	1	R	T	-	-	D7	-	-	~
14035	The Hill, Whitmore[32]	60/65 [A]	51/53 [A]	51/53 [C]	Day: Earthworks Eve: Tunnelling / tunnelling support Night: Tunnelling / tunnelling support	A	1	R	T	-	-	D2	-	-	~
14108	Netherset Lane, Madeley[33]	63/66 [A]	<45	33/38 [B]	Day: Earthworks Night: Tunnelling / tunnelling support	A	2	R	T	-	-	D11	-	-	~

[32] Change as a result of amendment: additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002).

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
14129	The Holborn, Madeley[33]	57/65 [A]	<45	39/43 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	13	R	T	-	-	<D1	-	-	[34]
14137	Poolside, Madeley[33]	69/73 [B]	<45	34/37 [A]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	23	R	T	-	-	<D1	-	-	[34]
14141	Woore Road, Madeley[33]	69/73 [A]	<45	42/45 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	1	R	T	-	-	D3	-	-	~

[33] Change as a result of amendment: additional land required for provision of a power supply to Madeley tunnel(AP2-004-007).
[34] Given that the duration of the impact is less than 1 month, no effect is identified at this receptor.

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
14142	Station Road, Madeley[33]	65/72 [B]	<45	29/32 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	10	R	T	-	-	D2	-	-	CSV04-C06
14144	Smithy Corner, Madeley[33]	70/74 [B]	<45	30/34 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	3	R	T	-	-	D <1	-	-	[34]
14146	Haywood Court, Madeley[35]	74/74 [B]	<45	36/39 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	5	R	T	-	-	D <1	-	-	[34]
14150	Moss Lane, Madeley[35]	73/73 [C]	<45	42/46 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	NA	10	R	T	-	-	D1	-	-	

[35] Change as a result of amendment: additional land for a new Severn Trent Water water mains supply to the Madeley tunnel north portal building (AP2-004-104).

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
14158	Mallard Close, Madeley[36]	60/69 [A]	<45	43/47 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	5	R	T	-	-	D <1	-	-	[34]
14161	Bar Hill, Madeley[36]	60/68 [A]	<45	44/48 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	2	R	T	-	-	D4	-	-	CSV04-C02
14163	Bar Hill, Madeley[36]	75/77 [B]	<45	24/28 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	11	R	T	-	-	D3	-	NI	CSV04-C02
14165	Bar Hill, Madeley[36]	62/67 [A]	<45	36/39 [B]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	1	R	T	-	-	D6	-	-	CSV04-C02

[36] Change as results of amendment: additional land for the diversion of a Severn Trent Water water mains supply at the A525 Bar Hill Road(AP2-004-105).

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
14200	Wrinehill Hall Farm, Hill Lane, Wrinehill[37]	62/66 [A]	<45	31/34 [A]	Day: Earthworks Night: Tunnelling	A	1	R	T	-	-	D11	-	-	~
14234	Monument Lodge, Manor Road, Madeley[32]	69/72 [A]	<45	36/40 [C]	Day: Underground utility diversion Night: Tunnelling / tunnelling support	A	1	R	T	-	-	D2	-	-	~

[37] Change as a result of amendment: additional land for a new Severn Trent Water water mains supply to the Madeley tunnel north portal building (AP2-004-104).

Airborne sound: indirect effects

5.2.7 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

5.2.8 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Effects arising during operation

Introduction

5.2.9 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, Whitmore Heath to Madeley Community area report.

Avoidance and mitigation measures

5.2.10 The avoidance and mitigation measures are set out in the main ES Volume 2, Whitmore Heath to Madeley Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

5.2.11 The direct ground-borne sound and vibration effects associated with the AP2 revised scheme, for the assessment locations defined for the quantitative assessment of ground-borne sound and vibration impacts are shown on the main ES Map Series SV-02 in the CA4 Volume 5, Map Book.

5.2.12 For each assessment location, the assessment results for residential receptors are presented in Table 23. Explanation of the information in Table 23 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES.

5.2.13 The principal AP2 amendment responsible for the change in operational ground-borne noise and vibration effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

Table 23: Operational ground-borne sound and vibration levels, noise and vibration impacts and effects for residential and non-residential receptors (AP2 revised scheme)

Assessment location		Impact criteria				Significance criteria								Significant effect
Ref	Area represented	Ground-borne sound level dBL_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	
14035	The Hill, Whitmore[38]	30	0.16	0.08	-	1	NA	R	T	-	-	-	-	
14043	Heath Road, Whitmore[38]	21	0.03	0.01	-	2	NA	R	T	-	-	-	-	
14046	Heath Road, Whitmore[38]	26	0.04	0.02	-	1	NA	R	T	-	-	-	-	
14047	Broadlands, Heath Rise, Whitmore Heath[38]	38	0.15	0.07	-	1	A	R	T	-	-	-	-	
14052	Heath Road, Whitmore Heath[38]	27	0.05	0.02	-	2	NA	R	T	-	-	-	-	
14054	Heath Road, Whitmore[38]	35	0.11	0.05	-	1	A	R	T	-	-	-	-	
14055	Heath Road, Whitmore[38]	24	0.04	0.02	-	5	NA	R	T	-	-	-	-	
14056	Wyndways, Whitmore Heath[38]	40	0.19	0.09	-	1	A	R	T	-	-	-	-	
14058	Sandy Ridge, Whitmore Heath[38]	36	0.14	0.07	-	1	A	R	T	-	-	-	-	

[38] Change as a result of amendment: additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002).

Assessment location		Impact criteria				Significance criteria								
Ref	Area represented	Ground-borne sound level dBL_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
14059	Common Farm, Whitmore Heath[38]	28	0.05	0.03	-	2	NA	R	T	-	-	-	-	
14062	Hunters Way, Whitmore Heath[38]	34	0.10	0.05	-	1	NA	R	T	-	-	-	-	
14066	The Willows, Whitmore Heath[38]	32	0.08	0.04	-	1	A	R	T	-	-	-	-	
14067	The Dingle, Whitmore Heath[38]	22	0.03	0.02	-	1	NA	R	T	-	-	-	-	
14068	Kepplestone, Whitmore Heath[38]	28	0.06	0.03	-	1	NA	R	T	-	-	-	-	
14069	Fernridge / Mandarin House, Whitmore Heath[38]	24	0.04	0.02	-	3	NA	R	T	-	-	-	-	
14071	The Nook / Tree Tops, Whitmore Heath[38]	36	0.14	0.07	-	2	A	R	T	-	-	-	-	
14074	West Ridge, Birch Tree Lane, Whitmore Heath[38]	37	0.17	0.08	-	1	A	R	T	-	-	-	-	
14075	Birch Tree Lane, Whitmore[38]	29	0.06	0.03	-	1	NA	R	T	-	-	-	-	
14077	Birch Tree Lane, Whitmore[38]	24	0.04	0.02	-	2	NA	R	T	-	-	-	-	
14079	Birch Tree Lane, Whitmore[38]	30	0.07	0.03	-	1	NA	R	T	-	-	-	-	

Assessment location		Impact criteria				Significance criteria								
Ref	Area represented	Ground-borne sound level dBL_{pASmax}	VDV $m/s^{1.75}$ Daytime (07:00 - 23:00)	VDV $m/s^{1.75}$ Night time (23:00 – 07:00)	% increase or decrease in VDV	Number of impacts represented	Type of effect	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
14082	Birch Tree Lane, Whitmore[38]	25	0.04	0.02	-	1	NA	R	T	-	-	-	-	
14087	Snape Hall Cottage, Snape Hall Road, Whitmore[38]	32	0.20	0.10	-	1	NA	R	T	-	-	-	-	
14088	Woodberry / Foxdene, Snape Hall Road, Whitmore[38]	22	0.07	0.03	-	2	NA	R	T	-	-	-	-	
14241	The Brackens, Heath Road, Whitmore Heath[38]	39	0.18	0.09	-	1	A	R	T	-	-	-	-	

Airborne sound: direct impacts and effects

5.2.14 The direct effects from the operation of the AP2 revised scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the AP2 revised scheme, have been assessed. The assessment information, impact criteria and significance criteria for the incorporated mitigation at residential receptors are presented in Table 24 and Table 25, respectively.

5.2.15 The results should be considered in conjunction with the information contained in the main ES and SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02. Explanation of the information in Table 24 and Table 25 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES.

5.2.16 The principal AP2 amendment responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

Table 24: Operational airborne sound, noise impacts and significant effects: residential receptors (AP2 revised scheme)

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14008	Chorlton Brook Cottage, Hill Chorlton[39]	58	49	74/75	60	56	59	62	57	2	1	A	2	R	T	H	-	-	-	
14009	Chorlton Mill Farm, Stableford[39]	58	48	73/74	55	51	59	60	53	5	2	A	1	R	T	-	-	-	-	OSV04-C01
14011	Holmcroft, Stableford[39]	53	43	70/71	49	45	59	54	47	5	2	A	7	R	T	-	-	-	-	OSV04-C01
14012	Cloud End, Hill Chorlton[39]	63	53	77/79	60	56	59	65	58	5	2	A	1	R	T	H	-	-	-	OSV04-C01
14014	Oaklands, Whitmore[39]	52	42	70/71	49	43	62	53	45	4	2	A	3	R	T	-	-	-	-	~
14015	Whitmore Hall: Dwellings and Committed Development 13/00403/Ful[39]	39	29	56/58	47	43	62	48	43	1	0	A	6	R	T	-	-	-	-	

[39] Change as a result of amendment: additional land required and changes to Bill powers for changes to the vertical and horizontal alignment between Hatton South cutting and Madeley Bridleway 1 accommodation green overbridge (AP2-004-002).

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14017	Smithfield Cottages, Whitmore[39]	46	36	63/64	58	53	62	58	53	0	0	A	10	R	T	-	-	-	-	
14019	Church Farm, Whitmore[39]	48	38	67/68	49	46	62	52	47	3	1	A	1	R	T	-	-	-	-	#
14022	The Delves, Hill Chorlton[39]	57	47	73/74	44	40	53	57	48	13	8	A	2	R	T	-	-	-	-	OSV04-C01
14023	Harfield, Hill Chorlton[39]	61	51	76/77	49	45	53	61	52	12	7	A	2	R	T	-	-	-	-	OSV04-C01
14024	Smithy Lane, Whitmore[39]	45	36	64/65	57	53	62	57	53	0	0	A	3	R	T	-	-	-	-	
14026	Whitmore Lea, Whitmore[39]	47	37	67/69	53	49	62	54	49	1	0	A	3	R	T	-	-	-	-	
14027	The Old Parsonage, Whitmore[39]	40	30	57/58	41	38	62	43	39	2	1	A	1	R	T	-	-	-	-	#
14028	The Grooms House, Hill Chorlton[39]	47	37	60/62	42	35	45	48	39	6	4	A	4	R	T	-	-	-	-	#
14030	Hawthorne Hill, Whitmore[39]	44	34	65/67	45	41	62	48	42	3	1	A	2	R	T	-	-	-	-	#

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14032	Jennings Farm, Hill Chorlton[39]	43	33	58/60	42	35	45	45	37	3	2	A	4	R	T	-	-	-	-	#
14033	The Old Rectory, Whitmore[39]	44	35	64/66	48	44	62	50	44	2	0	A	1	R	T	-	-	-	-	#
14035	The Hill, Whitmore[39]	33	24	64/65	50	46	62	50	46	0	0	A	1	R	T	-	-	-	-	
14036	Chapel House, Hill Chorlton[39]	43	34	61/63	49	42	45	50	43	1	1	A	5	R	T	-	-	-	-	
14037	Stone Road, Hill Chorlton[39]	45	35	64/65	39	35	45	46	38	7	3	A	1	R	T	-	-	-	-	#
14038	Coneygreave Farmhouse, Whitmore[39]	41	32	60/61	48	38	50	49	39	1	1	A	1	R	T	-	-	-	-	
14039	Appleton Drive, Whitmore[39]	41	32	59/60	57	54	58	57	54	0	0	A	15	R	T	-	-	-	-	
14041	Heath Road, Whitmore[39]	37	28	66/67	44	40	52	45	40	1	0	A	1	R	T	-	-	-	-	
14043	Heath Road, Whitmore[39]	27	18	54/56	44	40	52	44	40	0	0	NA	2	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14044	Coneygreave Lane, Whitmore[39]	37	27	55/57	43	38	50	44	38	1	0	NA	11	R	T	-	-	-	-	
14045	Dab Green, Whitmore[39]	36	26	52/53	43	43	60	44	43	1	0	NA	2	R	T	-	-	-	-	
14046	Heath Road, Whitmore[39]	16	10	37/38	44	38	51	44	38	0	0	NA	1	R	T	-	-	-	-	
14047	Broadlands, Heath Rise, Whitmore Heath[39]	17	10	5/5	44	40	52	44	40	0	0	NA	1	R	T	-	-	-	-	
14050	Common Lane, Whitmore[39]	33	24	55/56	61	58	62	61	58	0	0	A	9	R	T	H	-	-	-	
14051	Heath Road, Whitmore[39]	42	32	67/68	44	40	52	46	41	2	1	A	2	R	T	-	-	-	-	
14052	Heath Road, Whitmore Heath[39]	18	11	45/46	44	40	52	44	40	0	0	NA	2	R	T	-	-	-	-	
14053	Coneygreave Lane, Whitmore[39]	33	23	51/53	56	48	62	56	48	0	0	NA	8	R	T	-	-	-	-	
14054	Heath Road, Whitmore[39]	17	10	5/5	44	40	52	44	40	0	0	NA	1	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14055	Heath Road, Whitmore[39]	20	12	52/53	44	40	53	44	40	0	0	NA	5	R	T	-	-	-	-	
14056	Wyndways, Whitmore Heath[39]	17	10	5/5	44	40	52	44	40	0	0	NA	1	R	T	-	-	-	-	
14057	Heath Road, Whitmore[39]	32	22	55/56	44	40	53	44	40	0	0	A	1	R	T	-	-	-	-	
14058	Sandy Ridge, Whitmore Heath[39]	17	10	5/5	44	40	52	44	40	0	0	NA	1	R	T	-	-	-	-	
14059	Common Farm, Whitmore Heath[39]	23	14	61/62	44	40	52	44	40	0	0	NA	2	R	T	-	-	-	-	
14060	Fair-Green Road, Baldwin's Gate[39]	36	27	55/56	61	58	63	61	58	0	0	NA	24	R	T	H	-	-	-	
14061	Appleton Drive, Whitmore[39]	34	24	52/54	54	38	50	54	38	0	0	NA	4	R	T	-	-	-	-	
14062	Hunters Way, Whitmore Heath[39]	17	10	47/48	44	40	52	44	40	0	0	NA	1	R	T	-	-	-	-	
14063	Fair-Green Road, Baldwin's Gate[39]	36	26	54/55	47	44	50	47	44	0	0	NA	23	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14065	Appleton Drive, Whitmore[39]	34	24	53/54	56	38	50	56	38	0	0	NA	10	R	T	-	-	-	-	
14066	The Willows, Whitmore Heath[39]	24	15	64/65	44	40	52	44	40	0	0	NA	1	R	T	-	-	-	-	
14067	The Dingle, Whitmore Heath[39]	34	24	62/63	44	40	52	44	40	0	0	A	1	R	T	-	-	-	-	
14068	Kepplestone, Whitmore Heath[39]	45	36	76/77	44	40	52	48	41	4	1	A	1	R	T	-	-	-	-	#
14069	Fernridge / Mandarin House, Whitmore Heath[39]	41	31	69/70	44	40	52	46	41	2	1	A	3	R	T	-	-	-	-	
14070	Snape Hall Close, Whitmore[39]	31	22	50/51	46	38	50	46	38	0	0	NA	10	R	T	-	-	-	-	
14071	The Nook / Tree Tops, Whitmore Heath[39]	17	10	5/5	44	40	52	44	40	0	0	NA	2	R	T	-	-	-	-	
14072	Chorlton Moss Cottage, Baldwin's Gate[39]	38	29	59/60	36	32	45	40	34	4	2	A	6	R	T	-	-	-	-	#

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14073	The Chimes, Baldwin's Gate[39]	34	25	52/53	65	62	63	65	62	0	0	NA	5	R	T	H	-	-	-	
14074	West Ridge, Birch Tree Lane, Whitmore Heath[39]	25	16	65/67	44	40	52	44	40	0	0	A	1	R	T	-	-	-	-	
14075	Birch Tree Lane, Whitmore[39]	40	30	68/69	44	40	52	45	40	1	0	A	1	R	T	-	-	-	-	
14077	Birch Tree Lane, Whitmore[39]	44	35	68/69	40	36	52	46	38	6	2	A	2	R	T	-	-	-	-	#
14078	Snape Hall Road, Whitmore[39]	35	25	57/58	47	44	53	47	44	0	0	A	8	R	T	-	-	-	-	
14079	Birch Tree Lane, Whitmore[39]	45	35	72/73	44	40	52	47	41	3	1	A	1	R	T	-	-	-	-	#
14080	Station Cottages, Baldwin's Gate[39]	33	24	52/54	65	62	63	65	62	0	0	NA	9	R	T	H	-	-	-	
14081	Lea Close, Baldwin's Gate[39]	34	25	54/55	46	38	50	46	38	0	0	NA	41	R	T	-	-	-	-	
14082	Birch Tree Lane, Whitmore[39]	49	40	72/73	44	40	52	51	43	7	3	A	1	R	T	-	-	-	-	OSV04-C03

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14083	Tollgate House, Baldwin's Gate[39]	34	24	52/53	60	56	62	60	56	0	0	NA	26	R	T	H	-	-	-	
14084	Hillview Crescent, Baldwin's Gate[39]	34	25	55/56	65	61	63	65	61	0	0	NA	8	R	T	H	-	-	-	
14085	Hillview Crescent, Baldwin's Gate[39]	34	25	55/56	54	51	58	54	51	0	0	NA	28	R	T	-	-	-	-	
14086	Snape Hall Road, Whitmore[39]	43	34	62/64	46	43	52	48	43	2	0	A	3	R	T	-	-	-	-	
14087	Snape Hall Cottage, Snape Hall Road, Whitmore[39]	62	52	82/83	44	40	52	62	53	18	13	S	2	R	T	-	-	-	NI	OSV04-C03/ OSV04-D01
14088	Woodberry/Foxdene, Snape Hall Road, Whitmore[39]	61	51	83/84	42	38	52	61	51	19	13	S	2	R	T	-	-	-	NI	OSV04-C03/ OSV04-D01
14090	Snape Hall Road, Whitmore[39]	51	41	71/72	44	40	52	52	44	8	4	A	3	R	T	-	-	-	-	OSV04-C03

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14091	Sandyfields, Baldwin's Gate[39]	33	24	54/55	48	38	50	48	38	0	0	NA	27	R	T	-	-	-	-	
14094	Granary Cottage , Snape Hall Road, Whitmore[39]	54	45	73/74	37	34	52	54	45	17	11	S	1	R	T	-	-	-	NI	OSV04-C03/ OSV04-D01
14098	Walls Wood, Baldwin's Gate[39]	45	35	62/63	55	52	58	55	52	0	0	A	1	R	T	-	-	-	-	
14099	Walls Wood, Baldwin's Gate[39]	46	37	63/64	54	50	53	55	50	1	0	A	19	R	T	-	-	-	-	
14100	Netherset Lane, Madeley[39]	48	38	63/64	45	40	51	50	42	5	2	A	1	R	T	-	-	-	-	#
14101	Park Wood Drive, Baldwin's Gate[39]	47	37	62/64	54	50	53	55	50	1	0	A	7	R	T	-	-	-	-	
14102	Park Wood Drive, Baldwin's Gate[39]	46	36	62/63	51	47	53	52	47	1	0	A	15	R	T	-	-	-	-	
14103	Eastwood Rise, Baldwin's Gate[39]	46	36	61/63	50	47	53	51	47	1	0	A	6	R	T	-	-	-	-	

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14104	Park Wood Drive, Baldwin's Gate[39]	45	36	61/62	47	43	53	49	44	2	1	A	15	R	T	-	-	-	-	
14105	Manor Glade, Baldwin's Gate[39]	42	32	58/60	46	42	53	47	42	1	0	A	12	R	T	-	-	-	-	
14106	Eastwood Rise, Baldwin's Gate[39]	47	37	61/62	50	46	53	52	46	2	0	A	7	R	T	-	-	-	-	
14108	Netherset Lane, Madeley[39]	52	42	68/69	45	40	51	53	44	8	4	A	2	R	T	-	-	-	-	~
14110	Park Wood Drive, Baldwin's Gate[39]	45	35	60/61	46	42	53	48	43	2	1	A	8	R	T	-	-	-	-	#
14111	Eastwood Rise, Baldwin's Gate[39]	45	36	60/61	46	43	53	49	44	3	1	A	11	R	T	-	-	-	-	#
14112	Manor Road, Madeley[39]	46	36	60/61	47	43	53	50	44	3	1	A	4	R	T	-	-	-	-	#
14113	Manor Road, Baldwin's Gate[39]	43	33	56/57	46	42	53	48	43	2	1	A	13	R	T	-	-	-	-	
14114	Manor Road, Baldwin's Gate[39]	40	30	54/55	43	36	53	45	37	2	1	NA	8	R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14115	Manor Road, Madeley[39]	47	37	61/63	46	42	53	49	43	3	1	A	11	R	T	-	-	-	-	#
14116	Manor Road, Madeley[39]	49	40	66/67	44	42	53	50	44	6	2	A	2	R	T	-	-	-	-	~
14120	Manor Road, Madeley[39]	53	43	71/72	44	42	53	54	46	10	4	A	1	R	T	-	-	-	-	~
14121	Dwelling at Hey House, Madeley[39]	64	55	80/81	40	35	58	64	55	24	20	S	1	R	T	-	-	-	NI	OSV04-D02
14131	Manor Road, Madeley[39]	62	52	76/78	53	42	51	62	52	9	10	A	1	R	T	-	-	-	-	~
14208	Snape Hall Farmhouse, Snape Hall Road, Whitmore Heath[39]	52	42	71/72	48	45	52	53	47	5	2	A	1	R	T	-	-	-	-	OSV04-C03
14210	Manor Farmhouse, Madeley (CD Ref: 10_00108_FULl)[39]	53	43	67/68	46	39	51	54	45	8	6	A	3	CD-R	T	-	-	-	-	~
14214	Appleton Drive, Whitmore (CD Ref.: 13_00145_OUT)[39]	33	24	52/53	59	38	50	59	38	0	0	NA	113	CD-R	T	-	-	-	-	

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14215	Birch Tree Lane, Whitmore (CD Ref.: 15_00281_FUL)[39]	46	36	65/66	46	43	52	49	44	3	1	A	1	CD -R	T	-	-	-	-	#
14220	Whitmore Arms, Madeley[39]	43	34	62/63	42	38	62	46	39	4	1	A	2	R	T	-	-	-	-	#
14240	Manor Road, Madeley[39]	53	43	67/68	46	39	51	54	45	8	6	A	1	R	T	-	-	-	-	~

Table 25: Operational airborne sound, noise impacts and significant effects: non-residential receptors (AP2 revised scheme)

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
8427(N)	Hey House and Edland Kennels/Cattery, Madeley	64	55	80/81	46	42	58	64	55	18	13	B	1	G5	T	-	-	-	-	OSV04-N01
14018(N)	St Mary's and All Saints' Church, Whitmore	44	34	62/63	54	51	62	54	51	0	0	B	1	G3	T	-	-	-	-	
14021(N)	North Staffordshire Hunt Kennels, Hill Chorlton	50	41	63/65	37	33	53	51	42	14	9	B	1	G5	T	-	-	-	-	~
14048(N)	Whitmore Village Hall, Whitmore	34	25	52/54	45	38	50	45	38	0	0	B	1	G3	T	-	-	-	-	
14076(N)	Baldwin's Gate Church of England Primary School	34	25	52/53	51	38	50	51	38	0	0	B	1	G4	T	-	-	-	-	
14130(N)	Madeley Cemetery, Madeley	63	53	80/82	55	50	58	63	55	8	5	B	1	G3	T	-	-	-	-	OSV04-N02
14145(N)	Madeley Allotment, Madeley	54	44	72/73	61	58	59	62	58	1	0	B	1	G5	T	H	-	-	-	

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	AP2 revised scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
14147(N)	Unreal Paintball Site, Manor Farm, Manor Road, Madeley	53	43	67/68	46	39	51	54	45	8	6	B	1	G5	T	-	-	-	-	~
14207(N)	Whitmore Post Office, Baldwin's Gate	34	24	52/53	66	38	50	66	38	0	0	B	1	G5	T	H	-	-	-	

Airborne sound: indirect impacts and effects

5.2.17 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

5.2.18 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.5.

6 South Cheshire (CA5)

6.1 Part 1: Supplementary Environmental Statement 2

Effects during construction

6.1.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, South Cheshire Community area report.

Avoidance and mitigation measures

6.1.2 The avoidance and mitigation measures are set out in the main ES Volume 2, South Cheshire Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

6.1.3 The SES2 changes do not change the likely significant effects identified in the main ES.

Airborne sound: direct impacts and effects

6.1.4 Activities associated with the construction phases of the SES2 scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

6.1.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. The assessment results, impact criteria and significance criteria for the assessment of the SES2 scheme at residential and non-residential receptors are presented in Table 26 and Table 27 respectively.

6.1.6 Explanation of the information within Table 26 and Table 27 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

6.1.7 The principal SES2 change responsible for the change in construction noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

Table 26: Assessment of construction noise at residential receptors (SES2 scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor LpAeq [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15023	Checkley Lane, Wrinehill[40]	58/62 [A]	-	-	Day: Earthworks	NA	1	R	T	-	-	-	-	-	
15026	Checkley Lane, Wrinehill[40]	74/77 [A]	-	-	Day: Earthworks	A	1	R	T	-	-	D21	-	NI	~
15028	Checkley Lane, Wrinehill[40]	67/72 [A]	-	-	Day: Earthworks	A	3	R	T	-	-	D16	-	-	~
15026	Checkley Lane, Wrinehill[40]	74/77 [A]	-	-	Day: Earthworks	A	1	R	T	-	-	D21	-	NI	~
15028	Checkley Lane, Wrinehill[40]	67/72 [A]	-	-	Day: Earthworks	A	3	R	T	-	-	D16	-	-	~
15103	Chorlton Lane, Chorlton[40]	60/65 [A]	-	-	Day: Haul road construction	A	1	R	T	-	-	D3	-	-	~
15112	Newcastle Road, Chorlton[40]	70/76 [C]	-	-	Day: Demolition of bridge	A	1	R	T	-	-	D3	-	NI	CSV05-C05

[40] Change as a result of SES2 change: updates to construction programme and changes to construction traffic flows on site haul routes.

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor LpAeq [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
15114	Newcastle Road, Chorlton[40]	73/79 [C]	-	-	Day: Demolition of bridge	A	1	R	T	-	-	D4	-	NI	~
15115	Weston Lane, Basford[40]	60/66 [A]	-	-	Day: Demolition	A	2	R	T	-	-	D3	-	-	~
15120	Weston Lane, Basford[40]	65/69 [A]	-	-	Day: Track laying	A	1	R	T	-	-	D4	-	-	~

Table 27: Assessment of construction noise at non-residential receptors (SES2 scheme)

Assessment location		Impact criteria					Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]		Change		Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Night 2300-0700	Day 0700-1900	Night 2300-0700											
15140	Hough Methodist Church[40]	48/55	-	10	-	Day: On-site traffic	B	1	G 3	T	-	-	-	-	-	$

Airborne sound: indirect effects

6.1.8 Construction road traffic associated with the construction phases of the SES2 scheme and AP2 amendments would generate airborne noise. Given that the construction traffic model information is not available for the SES2 changes and AP2 amendments separately, the in-combination effects of the SES2 changes and AP2 amendments is presented in the SES2 section. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted. Data has been produced for a typical month during the construction period and for a worst-case month during the construction period. The results for potentially significant road links are presented in Table 28.

6.1.9 Explanation of the information within Table 28 is provided in in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

Table 28: Assessment of construction traffic noise levels – indirect effects (SES2 scheme and AP2 revised scheme)

Road name	Portion of road affected	Number of dwellings (approx.)	Daytime traffic sound levels, LpA10, 18 hr dB			Change compared to current traffic sound level (dB)		Combined impact	Significant effect
			Without HS2 (2017)	Typical month during construction	Peak month during construction	Typical month during construction	Peak month during construction		
Den Lane	From the junction with Mill Lane to the junction with the A531 at Wrinehill.	35	51	53	55	2	4	-	CSV05-C06

Effects arising during operation

Introduction

6.1.10 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, South Cheshire Community area report.

Avoidance and mitigation measures

6.1.11 The avoidance and mitigation measures are set out in the main ES Volume 2, South Cheshire Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne sound and vibration

6.1.12 The properties are located outside the scoping distance for ground-borne sound and vibration associated with residential dwellings, therefore no updated information is provided.

Airborne sound: direct impacts and effects

6.1.13 The direct effects from the operation of the SES2 scheme as well as any new, amended or altered roads or railway lines, which are identified as part of the SES2 scheme, have been assessed. The assessment information, impact criteria and significance criteria for incorporated mitigation at residential and non-residential receptors are presented in Table 29 and Table 30 respectively.

6.1.14 The results should be considered in conjunction with the information contained in the main ES and SES2 and AP2 ES Volume 5 Map Books, Map Series SV-02. Explanation of the information in Table 29 and Table 30 is provided in Table 5 and Volume 5: Appendix SV-001-000 of the main ES.

6.1.15 The principal SES2 change responsible for the change in operational airborne noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

Table 29: Operational airborne sound, noise impacts and significant effects: residential receptors (SES2 scheme)

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15040	Richmond Close, Wynchwood Park, Weston[41]	38	29	52/53	40	37	51	41	36	1	-1	NA	13	R	T	-	-	-	-	
15042	Wychwood Park, Weston[41]	40	30	54/55	40	37	51	42	36	2	-1	NA	12	R	T	-	-	-	-	
15045	Woodlands Drive, Wynchwood Park, Weston[41]	39	29	53/55	40	37	51	42	36	2	0	NA	16	R	T	-	-	-	-	
15046	Freshwater Drive, Wynchwood Park, Weston[41]	44	35	60/62	43	40	51	45	39	2	-1	A	7	R	T	-	-	-	-	
15047	Freshwater Drive, Wynchwood Park, Weston[41]	44	34	59/61	43	39	51	45	38	2	-1	A	12	R	T	-	-	-	-	
15049	Hampstead Drive, Wynchwood Park, Weston[41]	47	38	65/67	49	46	55	48	41	-1	-5	A	4	R	T	-	-	-	-	

[41] Change as a result of SES2 change: reconfiguration of the existing West Coast Main Line tracks between Madeley Bridleway 2 and A500 Shavington Bypass and provision of a new railway systems compound (SES2-001-001).

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15052	Hampstead Drive, Wynchwood Park, Weston[41]	45	36	61/63	45	41	55	47	39	2	-1	A	13	R	T	-	-	-	-	
15054	Hampstead Drive, Wynchwood Park, Weston[41]	47	38	63/65	50	47	55	49	41	-1	-6	A	9	R	T	-	-	-	-	
15055	Ashbourne Drive, Wynchwood Park, Weston[41]	44	35	57/58	42	38	51	45	38	4	0	A	8	R	T	-	-	-	-	#
15057	Ashbourne Drive, Wynchwood Park, Weston[41]	44	35	58/59	42	38	51	46	38	4	0	A	13	R	T	-	-	-	-	#
15058	Freshwater Drive, Wynchwood Park, Weston[41]	46	37	59/61	45	41	51	47	40	2	-1	A	9	R	T	-	-	-	-	
15061	Ashbourne Drive, Wynchwood Park, Weston[41]	45	36	60/62	42	39	51	46	39	4	0	A	15	R	T	-	-	-	-	#
15064	Kendal Way, Chorlton[41]	47	37	60/61	43	39	51	47	40	5	1	A	11	R	T	-	-	-	-	#

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15065	Springwater Drive, Wynchwood Park, Weston[41]	47	37	61/62	43	40	51	47	40	4	0	A	22	R	T	-	-	-	-	#
15066	Abbeydale Close, Crewe[41]	43	34	58/59	41	37	51	45	38	4	1	A	10	R	T	-	-	-	-	#
15067	Springwater Drive, Wynchwood Park, Weston[41]	47	37	61/62	43	40	51	48	40	4	0	A	7	R	T	-	-	-	-	#
15068	Abbeydale Close, Crewe[41]	45	35	59/61	41	38	51	46	39	4	0	A	8	R	T	-	-	-	-	#
15069	Freshwater Drive, Wynchwood Park, Weston[41]	49	40	63/64	52	48	55	50	42	-1	-6	A	7	R	T	-	-	-	-	
15071	Springwater Drive, Wynchwood Park, Weston[41]	47	38	61/62	43	40	51	48	40	5	1	A	5	R	T	-	-	-	-	#
15073	Springwater Drive, Wynchwood Park, Weston[41]	47	38	62/63	43	40	51	48	40	5	0	A	5	R	T	-	-	-	-	#
15074	Kendal Way, Chorlton[41]	48	38	61/62	43	40	55	48	40	5	1	A	11	R	T	-	-	-	-	#

Assessment location		Impact criteria									Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15076	Freshwater Drive, Wynchwood Park, Weston[41]	51	42	64/65	50	46	55	52	43	2	-3	A	6	R	T	-	-	-	-	
15077	Haverhill Close, Wynchwood Park, Weston[41]	45	35	60/61	50	43	51	49	42	-1	-1	A	9	R	T	-	-	-	-	
15079	Westwood Close, Wynchwood Park, Weston[41]	49	40	62/63	44	40	55	50	41	6	1	A	4	R	T	-	-	-	-	#
15081	Fairhaven, Wynchwood Park, Weston[41]	49	39	65/66	44	40	51	49	41	6	1	A	4	R	T	-	-	-	-	#
15082	Edenbridge Close, Wynchwood Park, Weston[41]	48	39	63/64	46	43	51	49	41	3	-1	A	21	R	T	-	-	-	-	#
15083	Westwood Close, Wynchwood Park, Weston[41]	50	42	64/66	47	43	55	50	43	3	0	A	6	R	T	-	-	-	-	OSV05-C05
15085	Fairhaven, Wynchwood Park, Weston[41]	49	41	66/67	46	42	51	49	42	3	0	A	11	R	T	-	-	-	-	#

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15086	St. Clements Court, Chorlton, Weston[41]	54	44	67/68	52	48	55	54	46	2	-3	NA	18	R	T	-	-	-	-	
15087	Chiltern Close, Wynchwood Park, Weston[41]	49	41	66/67	46	42	55	49	43	3	1	NA	16	R	T	-	-	-	-	#
15088	Kingswood Avenue, Wynchwood Park, Weston[41]	49	39	64/65	50	44	51	51	43	1	-1	NA	20	R	T	-	-	-	-	
15090	Henley Road, Wynchwood Park, Weston[41]	53	44	67/68	51	47	55	54	45	3	-2	A	6	R	T	-	-	-	-	OSV05-C05
15093	Henley Road, Wynchwood Park, Weston[41]	54	45	68/69	53	49	55	55	47	2	-3	NA	5	R	T	-	-	-	-	
15095	Chiltern Close, Wynchwood Park, Weston[41]	54	44	67/68	51	47	55	54	46	3	-2	A	3	R	T	-	-	-	-	OSV05-C05
15097	Chorlton Lane, Chorlton[41]	58	49	73/75	63	58	60	61	52	-2	-6	NA	1	R	T	H	-	-	-	

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15103	Chorlton Lane, Chorlton[41]	61	52	76/78	59	55	60	62	54	2	-1	NA	1	R	T	H	-	-	-	

Table 30: Operational airborne sound, noise impacts and significant effects: non-residential receptors (SES2 scheme)

Assessment location		Impact criteria										Significance criteria								
Ref	Area represented	SES2 scheme only (year 15 traffic)			Do nothing (opening year baseline)			Do something (opening year baseline + Year 15 traffic) ****		Change		Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Mitigation effect	Significant effect
		Day *	Night **	Max ***	Day *	Night **	Max ***	Day *	Night **	Day *	Night **									
15101	Wesleyan Methodist Chapel, Chorlton[41]	53	44	68/69	51	47	54	54	46	3	-1	B	1	G3	T	-	-	-	-	

Airborne sound: indirect impacts and effects

6.1.16 There is no material change in the airborne sound indirect effects compared to the original scheme or SES1 scheme as a result of the SES2 changes listed in Section 1.3.2.

Airborne sound levels used in other assessments

6.1.17 There is no material change in the airborne sound levels compared to the original scheme or SES1 scheme as a result of the SES2 changes listed in Section 1.3.2.

6.2 Part 2: Additional Provision 2 Environmental Statement

Effects during construction

Introduction

6.2.1 The assessment is reported first for ground-borne vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts, effects and significant effects are presented. The significant effects and the evidence used to support these conclusions are presented in the SES2 and AP2 ES Volume 2, South Cheshire Community area report.

Avoidance and mitigation measures

6.2.2 The avoidance and mitigation measures are set out in the main ES Volume 2, South Cheshire Community area report, Section 13.

Quantitative identification of impacts and effects

Ground-borne vibration

6.2.3 There is no material change in the ground-borne vibration effects compared to the main ES or where relevant the SES1 scheme or SES2 scheme.

Airborne sound: direct impacts and effects

6.2.4 Activities associated with the construction phases of the AP2 revised scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:

- residential receptors, both as individual dwellings and communities; and
- non-residential receptors, including quiet areas.

6.2.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly LAeq,T noise levels from construction activities have been calculated at the facade of all assessment locations, which are representative of a number of receptors in the study area. The assessment results, impact criteria and significance criteria for the assessment of the AP2 revised scheme at residential receptors are presented in Table 31. No non-residential receptors are affected by the amendments.

6.2.6 Explanation of the information within Table 31 is provided in Table 1 and Volume 5: Appendix SV-001-000 of the main ES.

6.2.7 The principal AP2 amendment responsible for the change in construction noise effects at the specific assessment locations reported in the following tables, are identified in the associated footnote.

Table 31: Assessment of construction noise at residential receptors (AP2 revised scheme)

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
26001	Goode Way / Gresty Road, Crewe[42]	54/54 [A]	54/54 [C]	54/54 [C]	All: Retaining wall construction	NA	23	R	T	-	-	-	-	-	
26002	Goode Way, Crewe[42]	68/70 [A]	68/70 [C]	68/70 [C]	All: Retaining wall construction	A	20	R	T	-	-	D: 3 E: 4 N: 7	-	NI	CSV05-C07
26003	Goode Way, Crewe[42]	67/70 [A]	67/70 [C]	67/70 [C]	All: Retaining wall construction	A	24	R	T	-	-	D: 3 E: 4 N : 6	-	NI	CSV05-C07
26004	Ivatt Drive, Crewe[42]	64/66 [A]	64/66 [C]	64/66 [C]	All: Retaining wall construction	A	24	R	T	-	-	D: 1 E: 2 N: 3	-	NI	CSV05-C07
26005	Worsdell Close, Crewe[42]	57/58 [A]	57/58 [C]	57/58 [C]	All: Retaining wall construction	A	2	R	T	-	-	N: 2	-	-	~

[42] As a result of AP amendment: rail systems modifications and civil engineering works in and around Crewe Station; and removal of rail systems and civil engineering modifications to the Crewe-Cheadle Hulme Line (AP2-005-013).

Assessment location		Impact criteria				Significance criteria									
Ref	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the facade [assessment category A/B/C]			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Impact duration (months)	Combined impact	Mitigation effect	Significant effect
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
26006	Goode Way, Crewe[42]	63/63 [A]	63/63 [C]	63/63 [C]	All: Retaining wall construction	A	5	R	T	-	-	N: 1	-	-	~
26007	Goode Way / Worsdell Close, Crewe[42]	44/48 [A]	44/48 [C]	44/48 [C]	All: Retaining wall construction	NA	13	R	T	-	-	-	-	-	
26008	Worsdell Close, Crewe[42]	30/36 [A]	<45	30/36 [C]	All: Retaining wall construction	NA	8	R	T	-	-	-	-	-	
26009	Goode Way / Gresty Road, Crewe[42]	30/36 [A]	<45	30/36 [C]	All: Retaining wall construction	NA	12	R	T	-	-	-	-	-	

Airborne sound: indirect effects

6.2.8 There is no material change in the airborne sound indirect effects compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Airborne sound levels used in other assessments

6.2.9 There is no material change in the airborne sound levels used in other assessments compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

Effects arising during operation

6.2.10 There is no material change in the operational sound, noise and vibration compared to the original scheme or where relevant, SES1 scheme or SES2 scheme, as a result of the AP2 amendments listed in Section 1.3.4.

7 References

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2a-environmental-statement.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Scope and Methodology Report, Volume 5: Appendix CT-001-001.* Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627187/E23_EIA_SMR_CT-001-001_WEB.pdf.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Scope and Methodology Report Addendum, Volume 5: Appendix CT-001-002*. Available online at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627188/E24A_CT-001-002_Part_1_WEB.pdf and https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/627189/E24-B_CT-001-002_Part_B_WEB.pdf.

HS2 Ltd (2017), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Environmental Statement, Draft Code of Construction Practice*, Volume 5: Appendix CT-003-000. Available online at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/627182/E26_CT-003-000_WEB.pdf.

HS2 Ltd (2018), *High Speed Two (HS2) Phase 2a (West Midlands - Crewe), Supplementary Environmental Statement and Additional Provision Environmental Statement*. Available online at: https://www.gov.uk/government/collections/hs2-phase-2a-supplementary-environmental-statement-and-additional-provision-environmental-statement.

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