

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

Volume 5 | Technical appendices map book
Sound, noise and vibration

October 2015

SES3 and AP4 ES 3.5.2.9

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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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Map series description	<p><i>SV-01 presents the predicted operational sound from the new railway.</i></p> <p><i>The sound levels from the new railway (expressed as LpAeq,T) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.</i></p>	<p><i>SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.</i></p> <p><i>The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Volume 2 and Volume 5.</i></p>	<p><i>The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.</i></p> <p><i>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.</i></p>	<p><i>The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.</i></p> <p><i>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.</i></p>
Community Forum Area name				
CFA 04 – Kilburn (Brent) to Old Oak Common	x	x	x	x
CFA 05 – Northolt Corridor	x	x	x	x
CFA 06 – South Ruislip to Ickenham	✓	✓	✓	✓
CFA 07 – Colne Valley	x	x	x	x
CFA 08 – The Chalfonts and Amersham	x	x	x	x
CFA 09 – Central Chilterns	✓	✓	x	✓
CFA 10 – Dunsmore, Wendover and Halton	x	x	x	x
CFA 11 – Stoke Mandeville and Aylesbury	✓	✓	x	x
CFA 12 – Waddesdon and Quainton	x	x	x	x
CFA 13 – Calvert, Steeple Claydon, Twyford and Chetwode	✓	✓	✓	x
CFA 14 – Newton Purcell to Brackley	✓	✓	x	x
CFA 15 – Greatworth to Lower Boddington	✓	✓	x	x
CFA 16 – Ladbroke and Southam	x	x	x	x
CFA 17 – Offchurch and Cublington	x	x	x	x
CFA 18 – Stoneleigh, Kenilworth and Burton Green	x	x	x	x
CFA 19 – Coleshill Junction	x	x	✓	x
CFA 20 – Curdworth to Middleton	x	x	x	x
CFA 21 – Drayton Bassett, Hints and Weeford	x	x	x	x

Map series name	SV-01 - Operational Sound Contour Maps and Likely Significant Effects	SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)	SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments	SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments
Map series description	<p><i>SV-01 presents the predicted operational sound from the new railway.</i></p> <p><i>The sound levels from the new railway (expressed as LpAeq,T) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.</i></p>	<p><i>SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.</i></p> <p><i>The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Volume 2 and Volume 5.</i></p>	<p><i>The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.</i></p> <p><i>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.</i></p>	<p><i>The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.</i></p> <p><i>The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.</i></p>
Community Forum Area name				
CFA 22 – Whittington to Handsacre	x	x	x	x
CFA 23 – Balsall Common and Hampton-in-Arden	x	x	✓	x
CFA 24 – Birmingham Interchange and Chelmsley Wood	x	x	x	x
CFA 25 – Castle Bromwich and Bromford	x	x	✓	x
CFA 26 – Washwood Heath to Curzon Street	x	x	x	x
Off-route – Heathrow Express (HEX) Depot Relocation	x	x	x	x
Off-route – Modifications to WCML between Lichfield and Colwich	x	x	x	x

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Mapping explanatory notes

Structure of the HS2 Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

The Supplementary Environmental Statement 3 (SES3) and Additional Provision 4 Environmental Statement (AP4 ES) comprises:

- Non-technical summary (NTS). This provides a summary in non-technical language of the SES3 (Part 1) and AP4 ES (Part 2) and of any likely significant environmental effects, both beneficial and adverse, which are new or different to those reported in the High Speed 2 (HS2) Phase One Environmental Statement (ES) submitted to Parliament in November 2013 in support of the hybrid Bill ('the Bill') for Phase One of HS2 (hereafter referred to as 'the main ES') as updated by subsequent SES and AP ES documents;
- Volume 1: Introduction to the SES3 and AP4 ES. This introduces the supplementary environmental information and design changes included within the SES3 and amendments, which have resulted in the need to amend the Bill, within the AP4 ES. It also explains any changes to the scope, methodology, assumptions and limitations required for the environmental assessment;
- Volume 2: CFA reports and Map Books. These describe the supplementary environmental information and design changes included within the SES3 (Part 1) and amendments within the AP4 ES (Part 2). Any new or different likely significant environmental effects arising from these changes and amendments in each CFA, compared to those reported in the main ES, as updated by SES and SES2 documents (and SES3 for the AP4 amendments) are reported. The AP1, AP2 and AP3 amendments are also taken into account where relevant. In addition, the main local alternatives that have been considered are described, where relevant;
- Volume 3: Route-wide effects. This reports new or different likely significant route-wide effects arising from the supplementary environmental information and design changes included within the SES3 (Part 1) and amendments within the AP4 ES (Part 2) compared to those reported in the main ES as updated by SES and SES2 (and SES3 for the AP4 amendments). The AP1, AP2 and AP3 amendments are also taken into account where relevant;
- Volume 4: Off-route effects. This reports new or different likely significant off-route effects arising from the supplementary environmental information included within the SES3 and an amendment within the AP4 ES compared to those reported in the main ES as updated by SES and SES2 (and SES3 for the AP4 amendment). The AP1, AP2 and AP3 amendments are also taken into account where relevant;
- Volume 5: Appendices and Map Books. This contains environmental information and associated maps in support of the other volumes of the SES3 and AP4 ES; and
- Glossary of terms and list of abbreviations. This contains any new or different terms and abbreviations used throughout the SES and AP ES reports, compared to those included in the main ES.

Copyright statements

Copyright statements are presented in the Data dictionary and definitions section at the front of the map book, due to limited space to include this on the individual maps themselves.

Ordnance Survey data

All maps produced as part of the SES3 and AP4 ES contain Ordnance Survey (OS) data. HS2 Ltd use the most up to date mapping available, where possible, supplied by the OS and as such, we cannot be held responsible for any inaccuracies within this data.

As part of our licence conditions, all digital maps carry a watermark.

Chainage

Most of the maps presented as part of the SES3 and AP4 ES have a chainage value shown next to the alignment. Chainage is presented on the maps in black font, in the form of XX+YYY. E.g. 77+000 or 158+500.

Chainage (known as reference chainage) is referenced from Euston Station, which is 0+000, and the value presented is in metres. E.g. 77+000 refers to the point, 77,000m, or 77km, from Euston Station. Chainage values increase in intervals dependant on the map scale. For maps at 1:50,000 scale chainage is shown at 5km intervals. For maps at 1:25,000 scale chainage is shown at 2km intervals. For maps at 1:10,000, 1:5,000 and 1:2,500 scales, chainage is shown at 1km intervals.

Chainage has been included on the maps as a useful tool for comparing different map sets showing the different environmental themes or engineering plans, due to map sets having different scales and therefore showing differing amounts of alignment on the map.

Map sheet layout

Each map in Volume 2 is presented twice, with the main ES map (published November 2013) on the left hand page and the SES₃ and AP₄ ES map on the right. For the CT-05 and CT-06 map series, the SES₃ and AP₄ ES map is annotated with different coloured clouds which highlight the areas of change. The coloured text box provides a brief description of the design change and amendment, and gives the SES₃ and AP₄ ES reference number. Only maps which have been amended as a result of the SES₃ and AP₄ ES are included within the map books. Other design changes which are within the existing limits of the Bill and do not result in new or different likely significant effects are also shown on the maps, but are not indicated by a cloud. The below table highlights the coloured clouds used, and their description.

Cloud / text box colour	Description
Blue	Design changes relating to the SES ₃ (Part 1 of each Volume 2 CFA report).
Red	Proposed amendments relating to AP ₄ (Part 2 of each Volume 2 CFA report).
Grey	Proposed amendments and design changes relating to previous APs and SESs, provided for reference.

Each Volume 5 map is annotated to describe the change to a receptor or significant effect, and to give the SES₃ and AP₄ ES reference number. For more detailed information about the SES₃ and AP₄ ES annotation, refer to the map series legend. Only maps which have been amended as a result of the SES₃ and AP₄ ES are included within the map book. Changes to receptors or significant effects relating to previous APs and SESs are also provided for reference.

Map orientation

The majority of the maps presented in these map books are presented with the railway alignment running horizontally across the page. The direction of travel to London would be following the alignment to the right hand side of the page, and the West Midlands to the left.

The exception to this, are map series LV-03 and LV-04, which present the alignment running from bottom to top of the page. This is to allow more of the modelled outputs to be shown at the appropriate map scale. In this instance, the direction of travel to London would be to the bottom of the page, and the West Midlands to the top.

Map books

In total there are 35 map books which make up the SES₃ and AP₄ ES, spread across volumes 2, 4 and 5. A list of the titles is provided below for reference.

Name	Name
Volume 2 Community forum area map book: CFA ₄ Kilburn (Brent) to Old Oak Common	Volume 2 Community forum area map book: CFA ₂₃ Balsall Common and Hampton-in-Arden
Volume 2 Community forum area map book: CFA ₅ Northolt Corridor	Volume 2 Community forum area map book: CFA ₂₄ Birmingham Interchange and Chelmsley Wood
Volume 2 Community forum area map book: CFA ₆ South Ruislip to Ickenham	Volume 2 Community forum area map book: CFA ₂₅ Castle Bromwich and Bromford
Volume 2 Community forum area map book: CFA ₇ Colne Valley	Volume 2 Community forum area map book: CFA ₂₆ Washwood Heath to Curzon Street
Volume 2 Community forum area map book: CFA ₈ The Chalfonts and Amersham	Volume 4 Off-route effects map book
Volume 2 Community forum area map book: CFA ₉ Central Chilterns	Volume 5 Technical appendices map book: Agriculture, forestry and soils
Volume 2 Community forum area map book: CFA ₁₀ Dunsmore, Wendover and Halton	Volume 5 Technical appendices map book: Air quality
Volume 2 Community forum area map book: CFA ₁₁ Stoke Mandeville and Aylesbury	Volume 5 Technical appendices map book: Community
Volume 2 Community forum area map book: CFA ₁₂ Waddesdon and Quainton	Volume 5 Technical appendices map book: Cultural heritage
Volume 2 Community forum area map book: CFA ₁₃ Calvert, Steeple Claydon, Twyford and Chetwode	Volume 5 Technical appendices map book: Ecology
Volume 2 Community forum area map book: CFA ₁₄ Newton Purcell to Brackley	Volume 5 Technical appendices map book: Land quality
Volume 2 Community forum area map book: CFA ₁₅ Greatworth to Lower Boddington	Volume 5 Technical appendices map book: Landscape and visual
Volume 2 Community forum area map book: CFA ₁₆ Ladbroke and Southam	Volume 5 Technical appendices map book: Socio-economics
Volume 2 Community forum area map book: CFA ₁₇ Offchurch and Cubbington	Volume 5 Technical appendices map book: Sound, noise and vibration
Volume 2 Community forum area map book: CFA ₁₈ Stoneleigh, Kenilworth and Burton Green	Volume 5 Technical appendices map book: Traffic and transport
Volume 2 Community forum area map book: CFA ₁₉ Coleshill Junction	Volume 5 Technical appendices map book: Water resources
Volume 2 Community forum area map book: CFA ₂₀ Curdworth to Middleton	Volume 5 Technical appendices map book: Cross-topic appendix 1 - Committed developments
Volume 2 Community forum area map book: CFA ₂₂ Whittington to Handsacre	

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

Volume 5 | Data dictionary and definitions

October 2015

Data dictionary and definitions

Legend features	Definition	Source	Copyright
Airborne sound and vibration assessment location	Locations near surface sections of the route at which a quantitative assessment of airborne sound and ground-borne vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Airborne sound assessment location	Locations at which a quantitative assessment of airborne sound impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Airborne sound, ground-borne sound and vibration assessment location	Locations at which a quantitative assessment of airborne sound, ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound & vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Airborne sound study area	This defines the area within which operational airborne sound impacts of the scheme have been quantitatively assessed. This area is defined as within 1km of surface sections of the route in rural areas and within 500m of surface sections of the route in urban areas.	High Speed Two (HS2) Ltd	
Baseline measurement locations	These represent locations at which sound measurements were carried out as part of the baseline sound surveys. Measurements of existing baseline sound levels at these locations have been used to derive baseline sound levels at operational and construction sound assessment locations. These baseline measurement locations are labelled with a reference number which enables cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002, which also describes how these are linked to baseline levels at assessment locations.	High Speed Two (HS2) Ltd	
Committed developments	This informs the assessment of the future baseline. A development consent or allocation that has full or outline planning permission, or is allocated in an adopted development plan.	High Speed Two (HS2) Ltd	© Crown copyright. Reproduced by permission of Ordnance Survey Licence Number 100049190. Year of Publication 2015.
Community forum boundary	The Environmental Statement has been split into 26 sections called Community Forum Areas.	High Speed Two (HS2) Ltd	© Crown copyright. Reproduced by permission of Ordnance Survey Licence Number 100049190. Year of Publication 2015.
Construction airborne sound and vibration assessment location	Locations at which a quantitative assessment of construction noise and vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in Volume 5: Appendix SV-003.	High Speed Two (HS2) Ltd	
Construction airborne sound assessment location	Locations at which a quantitative assessment of construction noise impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in Volume 5: Appendix SV-003.	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
Construction vibration assessment locations	Locations at which a quantitative assessment of construction vibration impacts of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the construction sound & vibration reports contained in Volume 5: Appendix SV-003.	High Speed Two (HS2) Ltd	
County boundary	County boundaries from Ordnance Survey boundary mapping.	Ordnance Survey	© Crown copyright. Reproduced by permission of Ordnance Survey Licence Number 100049190. Year of Publication 2015.
Depot, station, headhouse or portal building	Extends to cover operational footprint of each depot and station and the footprint of each tunnel vent shaft and headhouse at surface level. Excludes any ancillary buildings associated with these structures.	High Speed Two (HS2) Ltd	
District/Borough boundary	Ordnance Survey local authority boundary mapping.	Ordnance Survey	© Crown copyright. Reproduced by permission of Ordnance Survey Licence Number 100049190. Year of Publication 2015.
Engineering earthworks: Cutting	Cuttings created in the construction of the railway and associated works such as highways.	High Speed Two (HS2) Ltd	
Engineering earthworks: Embankment	Embankments created in the construction of the railway and associated works such as highways.	High Speed Two (HS2) Ltd	
Envisaged measures further reducing noise effects	<p>Other environmental features e.g. landscaping: These lines represent environmental mitigation features provided for reasons other than noise mitigation which also reduce sound levels from the Proposed Scheme to the surrounding environment. These features are not placed specifically to reduce or remove a likely significant noise effect. Examples include landscaping and visual mitigation earthworks (non-engineering earthworks).</p> <p>Engineering e.g. cuttings: These lines represent engineering features which reduce sound levels from the Proposed Scheme to the surrounding environment but are not placed specifically to reduce or remove a likely significant noise effect. Examples include cuttings and safety barriers on viaducts which are not close to sensitive receptors.</p>	High Speed Two (HS2) Ltd	
Envisaged mitigation to avoid / reduce significant noise effects	<p>Landscaping and/or fence barriers: These lines represent the envisaged mitigation provided specifically to reduce sound levels from the Proposed Scheme at sensitive receptors in order to reduce or remove likely operational significant noise effects. Examples include noise fence barriers or earth bunds (non-engineering earthworks) acting as noise barriers. These features are labelled with the height of the top of the barrier/bund above rail level.</p> <p>Engineering e.g. cuttings (green tunnels separately marked): These lines represent engineering features of the route which reduce sound levels from the Proposed Scheme at potentially significant sensitive receptors. These features, therefore, serve a material purpose in reducing or avoiding likely significant noise effects. Examples include engineering cuttings near to sensitive receptors. These features are labelled with the height of the top of the feature above rail level.</p>	High Speed Two (HS2) Ltd	
Ground-borne sound & vibration study area (highly sensitive non-residential)	This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at highly sensitive non-residential receptors have been quantitatively assessed. This area is defined as within 200m of the route.	High Speed Two (HS2) Ltd	
Ground-borne sound & vibration study area (residential and non-residential)	This defines the area within which direct operational ground-borne sound and vibration impacts of the scheme at residential and non-residential receptors have been quantitatively	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
	assessed. This area is defined as within 85m of the route.		
Ground-borne sound and/or vibration assessment location	Locations near tunnelled sections of the route at which a quantitative assessment of ground-borne sound and vibration impacts due to the operation of the Proposed Scheme has been carried out. These are labelled with an assessment location reference code to enable cross-reference to the operational sound & vibration reports contained in Volume 5: Appendix SV-004.	High Speed Two (HS2) Ltd	
Minor ground-borne noise or vibration impact	Buildings at which a minor operational ground-borne sound or vibration impact is predicted from the Proposed Scheme.	High Speed Two (HS2) Ltd	
Non engineering earthworks: Cutting	Cuttings created in the construction of landscape features and mitigation measures.	High Speed Two (HS2) Ltd	
Non engineering earthworks: Embankment	Embankments created in the construction of landscape features and mitigation measures.	High Speed Two (HS2) Ltd	
Operational airborne sound impacts at buildings	The buildings shown on SV-02 and SV-05 are colour-coded according to the magnitude of the predicted noise impacts of the Proposed Scheme. Noise impacts are calculated by comparing the sound levels predicted if the Proposed Scheme did not go ahead with those if it did (details of this process can be found in Volume 5: Appendix SV001-000). Panel B on SV-02/SV-05 contains a key showing the colours used with the corresponding impact categories. The impacts presented are the greatest (i.e. worst-case) of the impacts predicted for daytime and night-time.	High Speed Two (HS2) Ltd	
Potential additional noise insulation (triggered by maximum sound levels at night)	This represents dwellings which would potentially be provided with noise insulation due maximum sound levels from the Proposed Scheme (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001).	High Speed Two (HS2) Ltd	
Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)	This represents dwellings which would potentially be provided with noise insulation due to noise from the Proposed Scheme exceeding the World Health Organization (WHO) night noise guidelines interim target (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001).	High Speed Two (HS2) Ltd	
Potential noise insulation (triggered by Noise Insulation Regulations 1996)	This represents dwellings which would potentially qualify for noise insulation under the Noise Insulation (Railways and Other Guided Transport Systems) Regulations 1996 (further information regarding assessment criteria can be found in Volume 5 Appendix SV-001).	High Speed Two (HS2) Ltd	
Route in tunnel Route on surface	Represents the proposed route of HS2, split into route on surface and tunnelled sections.	High Speed Two (HS2) Ltd	
Sound Contours (SV-01)	The sound levels from the Proposed Scheme (expressed as $L_{pAeq,T}$ and representing sound from the new railway only) are presented in 5 dB steps. The levels are shown in the panel in the top-right hand corner of SV-01.	High Speed Two (HS2) Ltd	
Sound contours (SV-02/SV-05)	The sound levels from the Proposed Scheme (expressed as $L_{pAeq,T}$ and representing sound from the new railway only) are presented at two sound levels: 40 dB $L_{Aeq,T 23:00 to 07:00}$ and 55 dB $L_{Aeq,T 23:00 to 07:00}$. The corresponding daytime levels ($L_{Aeq,T 07:00 to 23:00}$) are shown in Panel A of SV-02/SV-05.	High Speed Two (HS2) Ltd	

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 5 | CFA6 South Ruislip to Ickenham

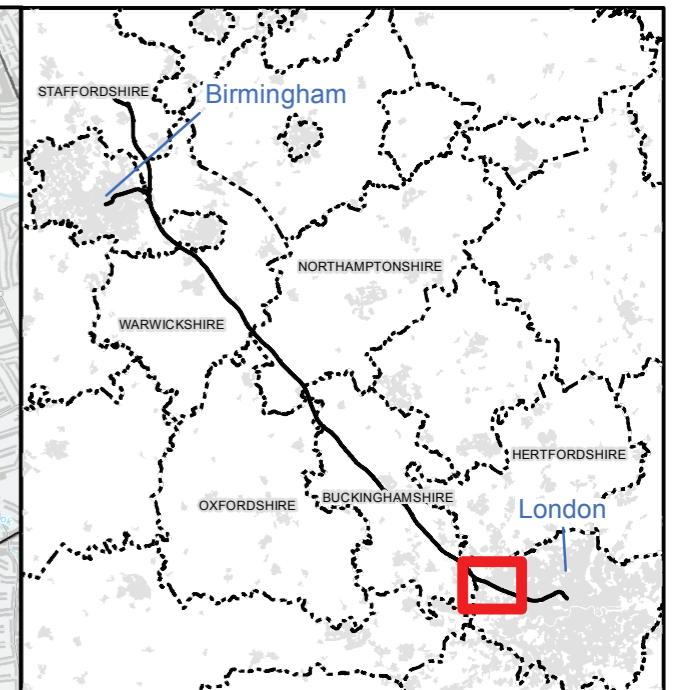
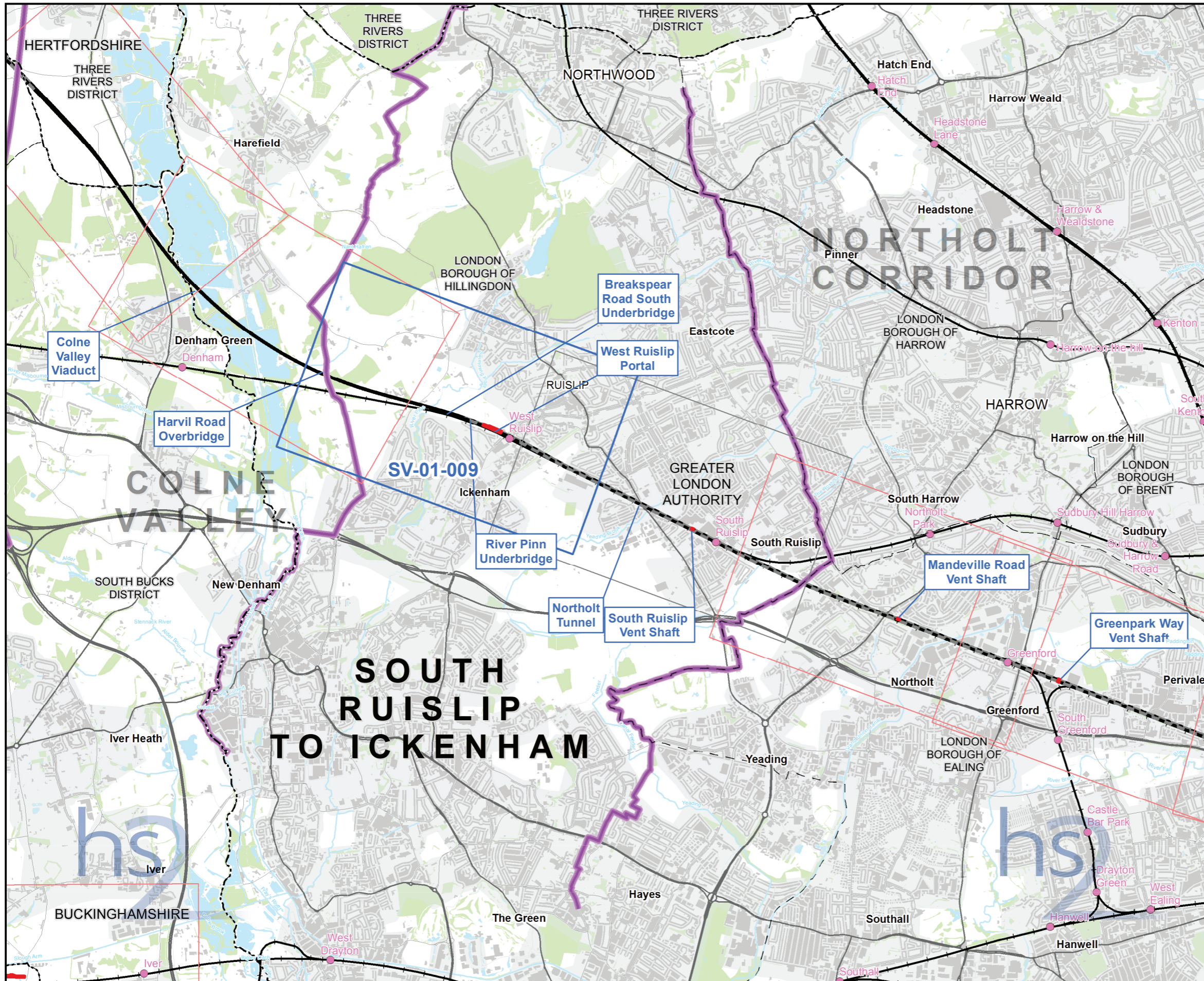
SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

October 2015



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Community forum boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community forum with amendment
	Map sheets included in this community forum with no amendment
	Map sheets not included in this community forum

Map Number	SV-01-INDEX-CFA6
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES3 and AP4 ES
Community Forum Area CFA6: South Ruislip to Ickenham	

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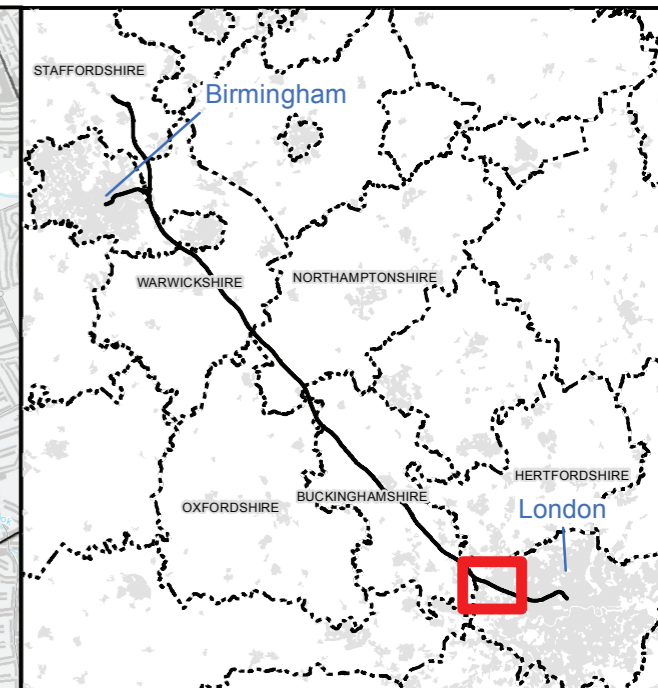
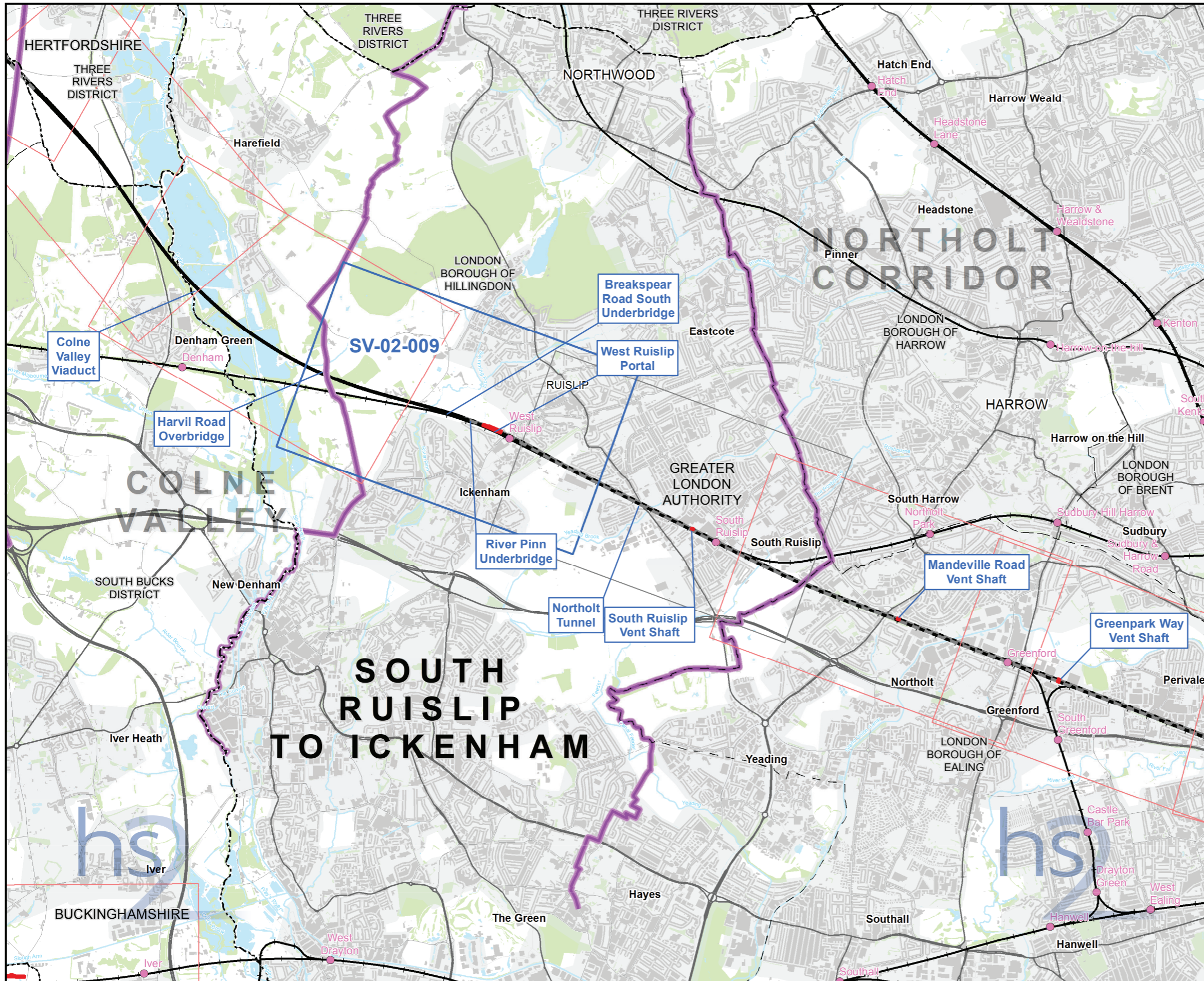
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Date: 14/09/15



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Community forum boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community forum with amendment
	Map sheets included in this community forum with no amendment
	Map sheets not included in this community forum

Map Number	SV-02-INDEX-CFA6
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant effects (with Assessment Locations) SES3 and AP4 ES
Community Forum Area CFA6: South Ruislip to Ickenham	

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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

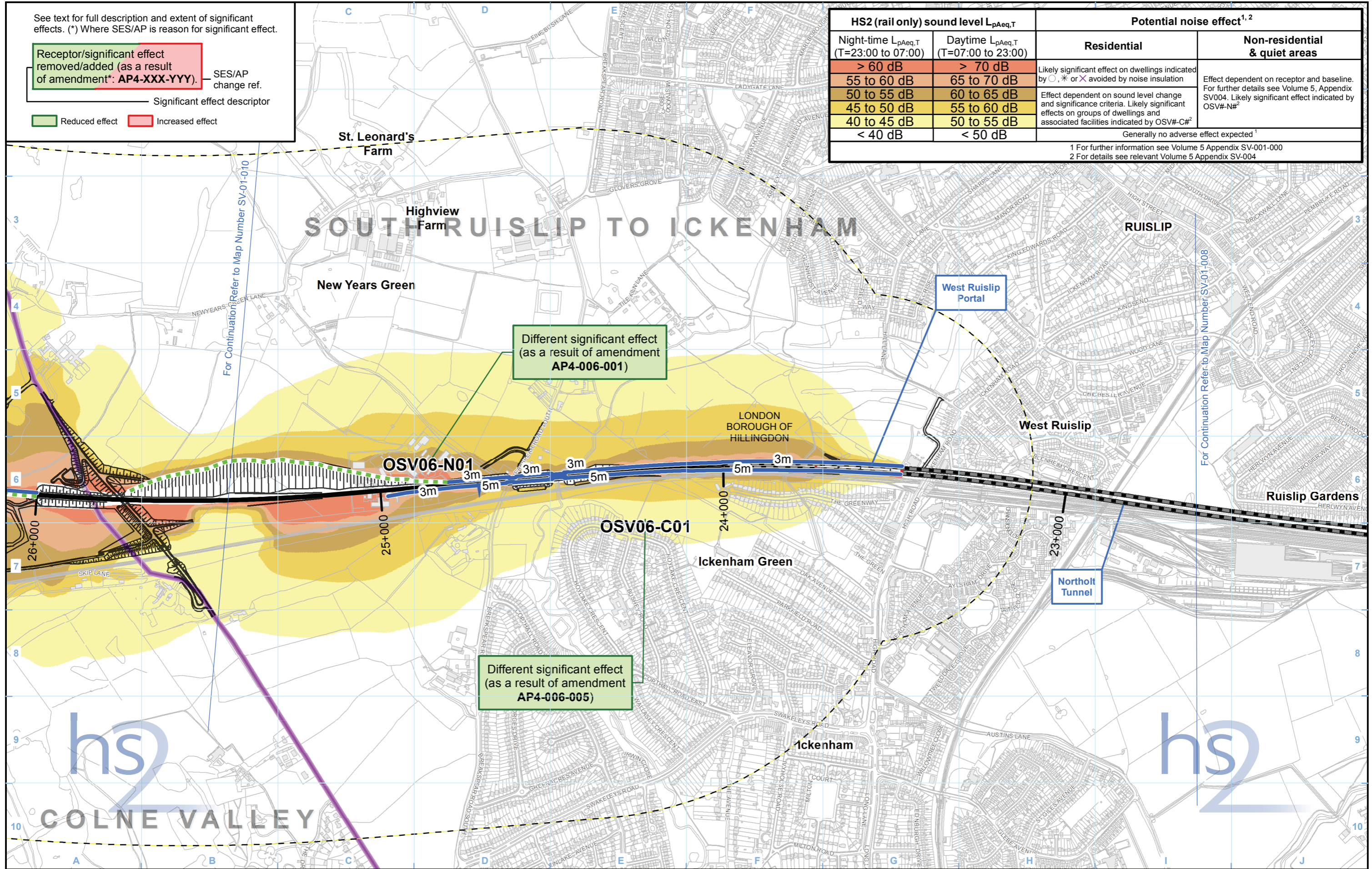
Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect (green box) Increased effect (red box)

HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Airborne sound study area

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-009

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA6: South Ruislip to Ickenham

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Doc Number: C250-ARP-EV-MAP-000-002174-AP04-P01

Date: 17/09/15

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect (green) Increased effect (red)

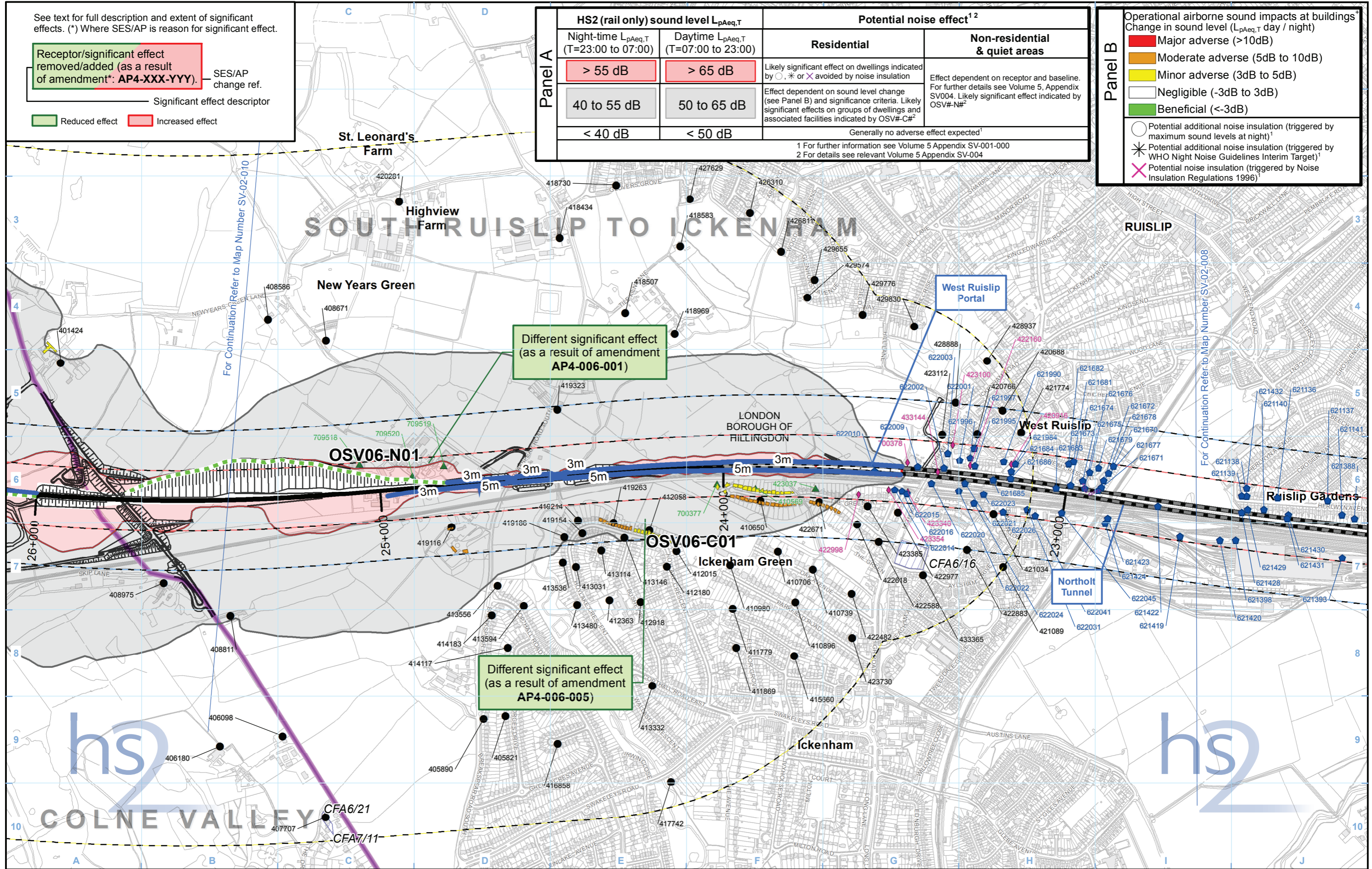
Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-C# ²
	40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

Operational airborne sound impacts at buildings¹
Change in sound level ($L_{pAeq,T}$ day / night)

Major adverse (>10dB)
Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)
Negligible (-3dB to 3dB)
Beneficial (<-3dB)

Potential additional noise insulation (triggered by maximum sound levels at night)¹
Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

* Residential buildings only
* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA##) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-009

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES

Community Forum Area CFA6: South Ruislip to Ickenham

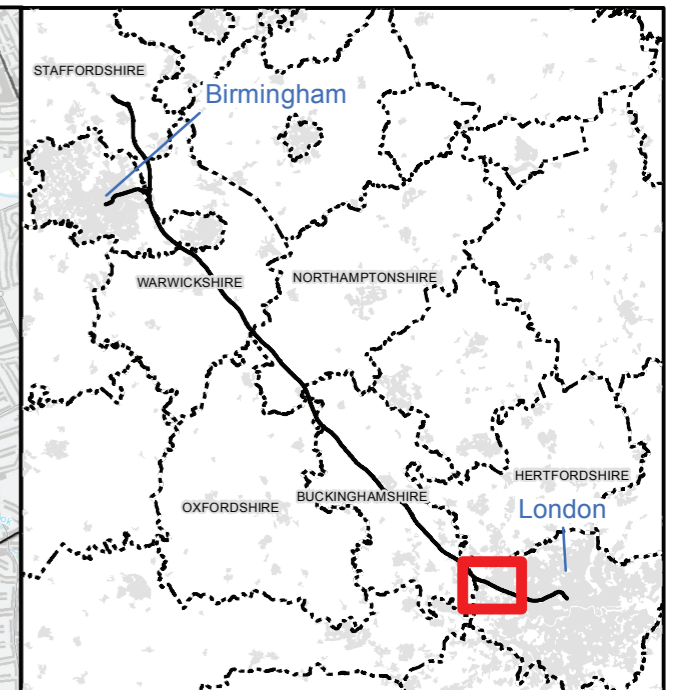
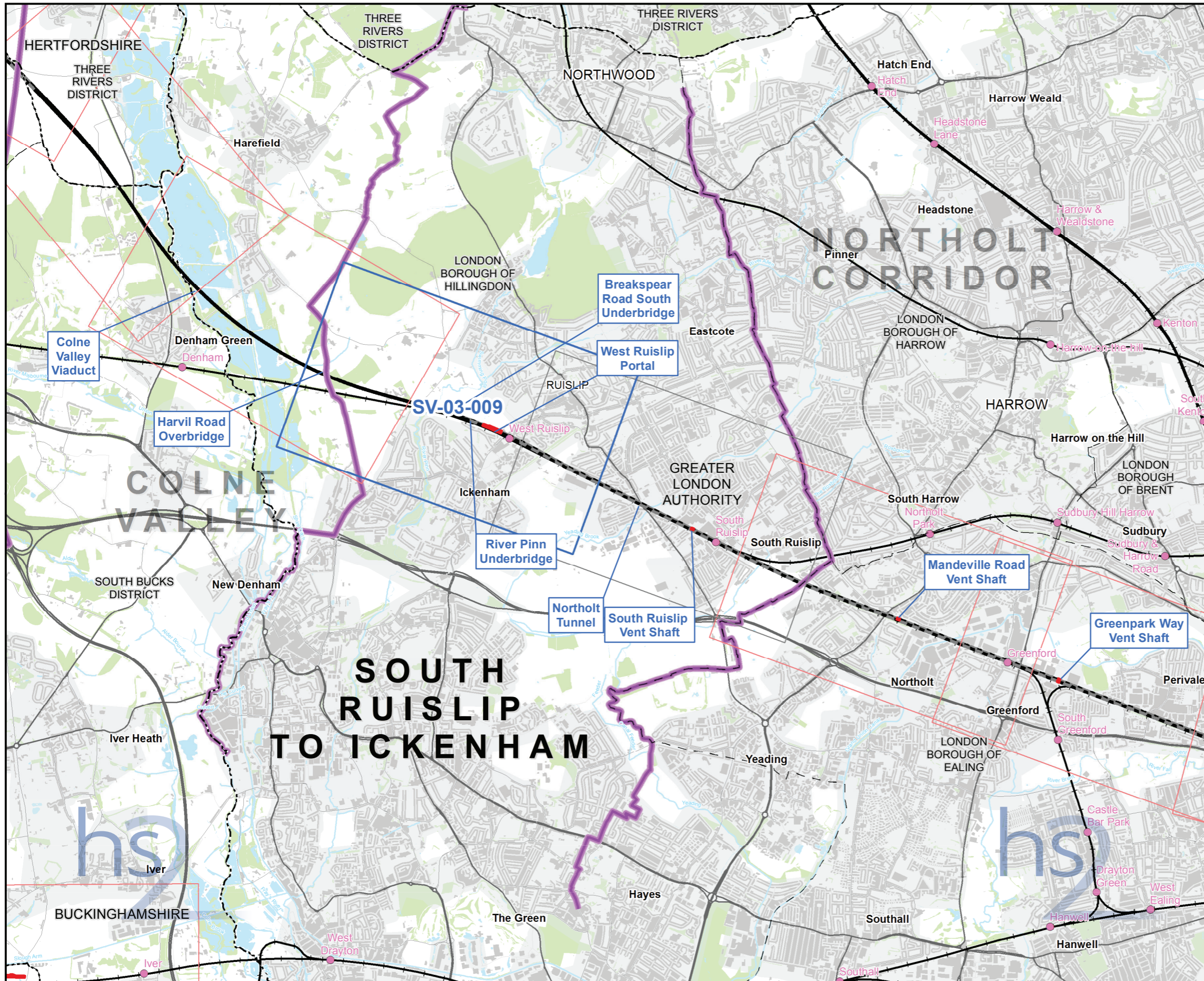
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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-03-INDEX-CFA6
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES
Community Forum Area CFA6: South Ruislip to Ickenham	

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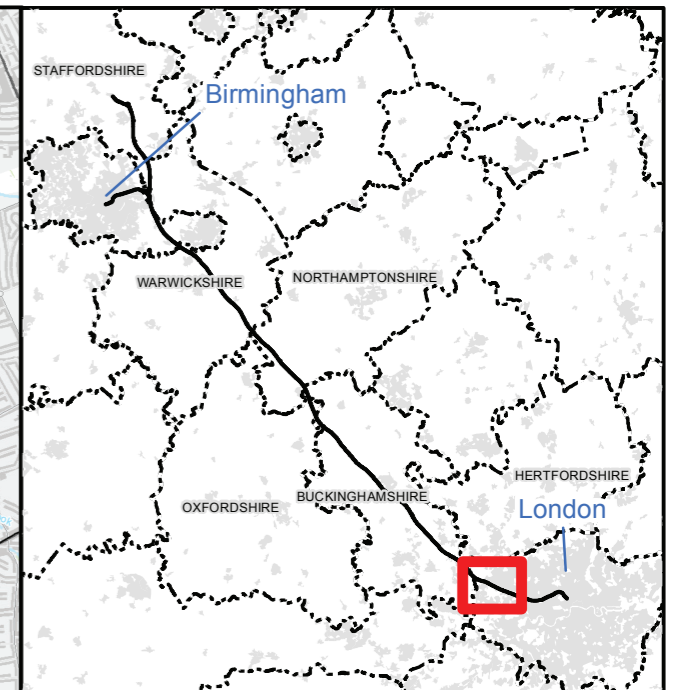
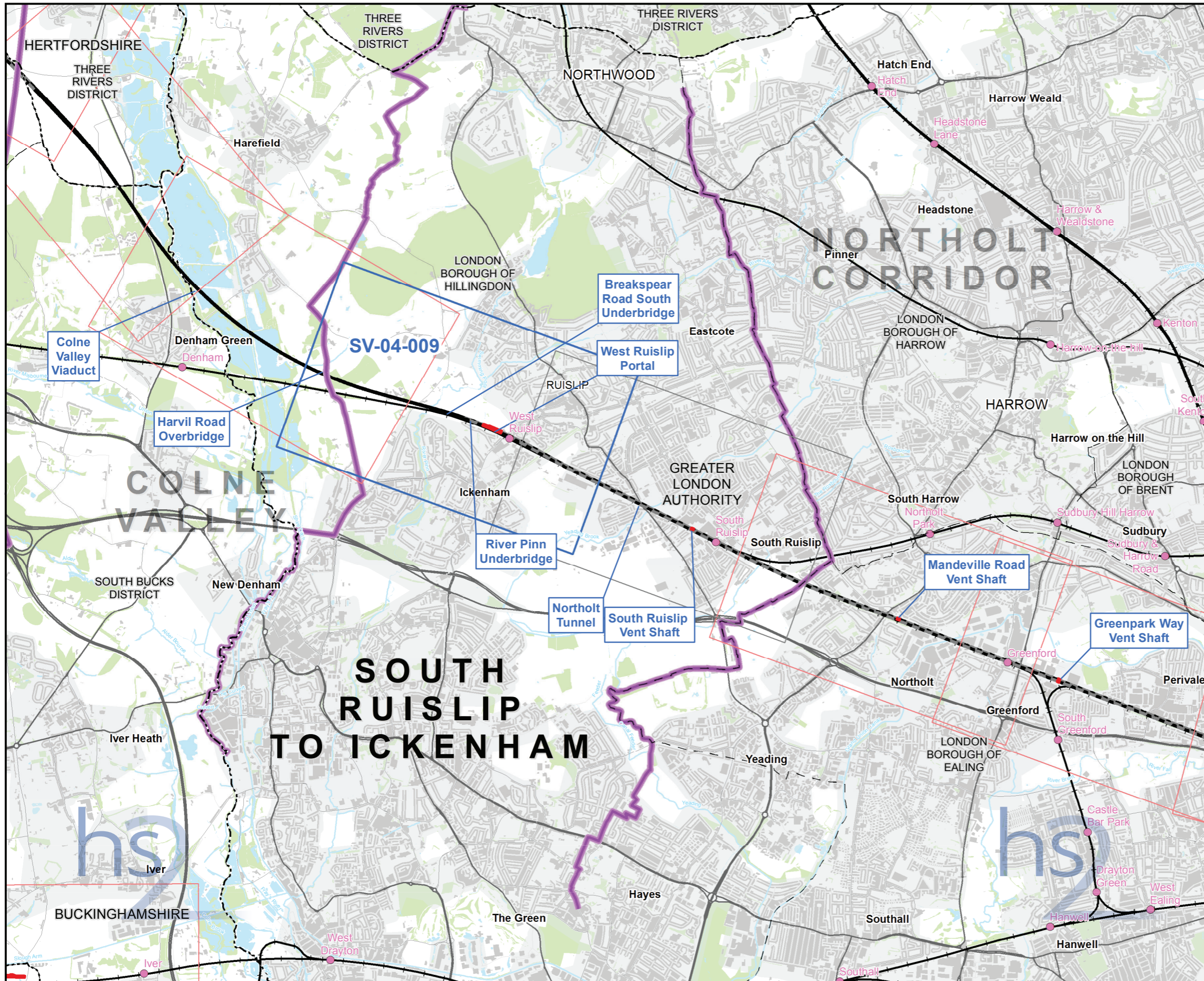
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0 500 1,000 1,500 2,000 Metres

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Doc Number: C250-ARP-EV-MAP-000-002098-AP04-P01 **Date: 14/09/15**



Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-04-INDEX-CFA6
Map Name	Index Map of: Assessment & Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES3 and AP4 ES
	Community Forum Area CFA6: South Ruislip to Ickenham

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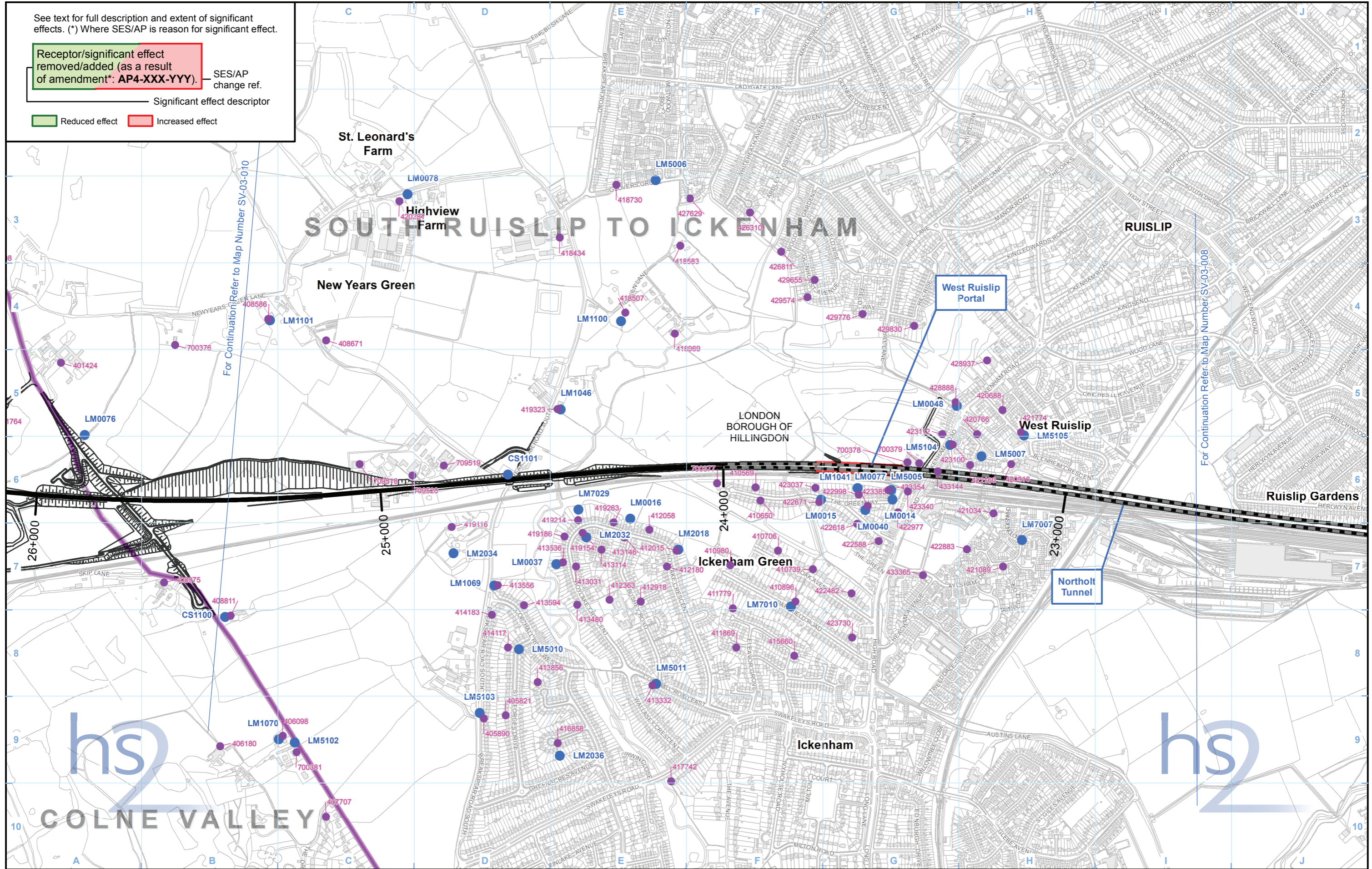
See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect

SOUTH RUISLIP TO ICKENHAM



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:	Non engineering earthworks:
Embankment	Embankment
Cutting	Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV003)

(labelled with Measurement Location reference code)

Map Number: SV-03-009

Map Name: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA6: South Ruislip to Ickenham

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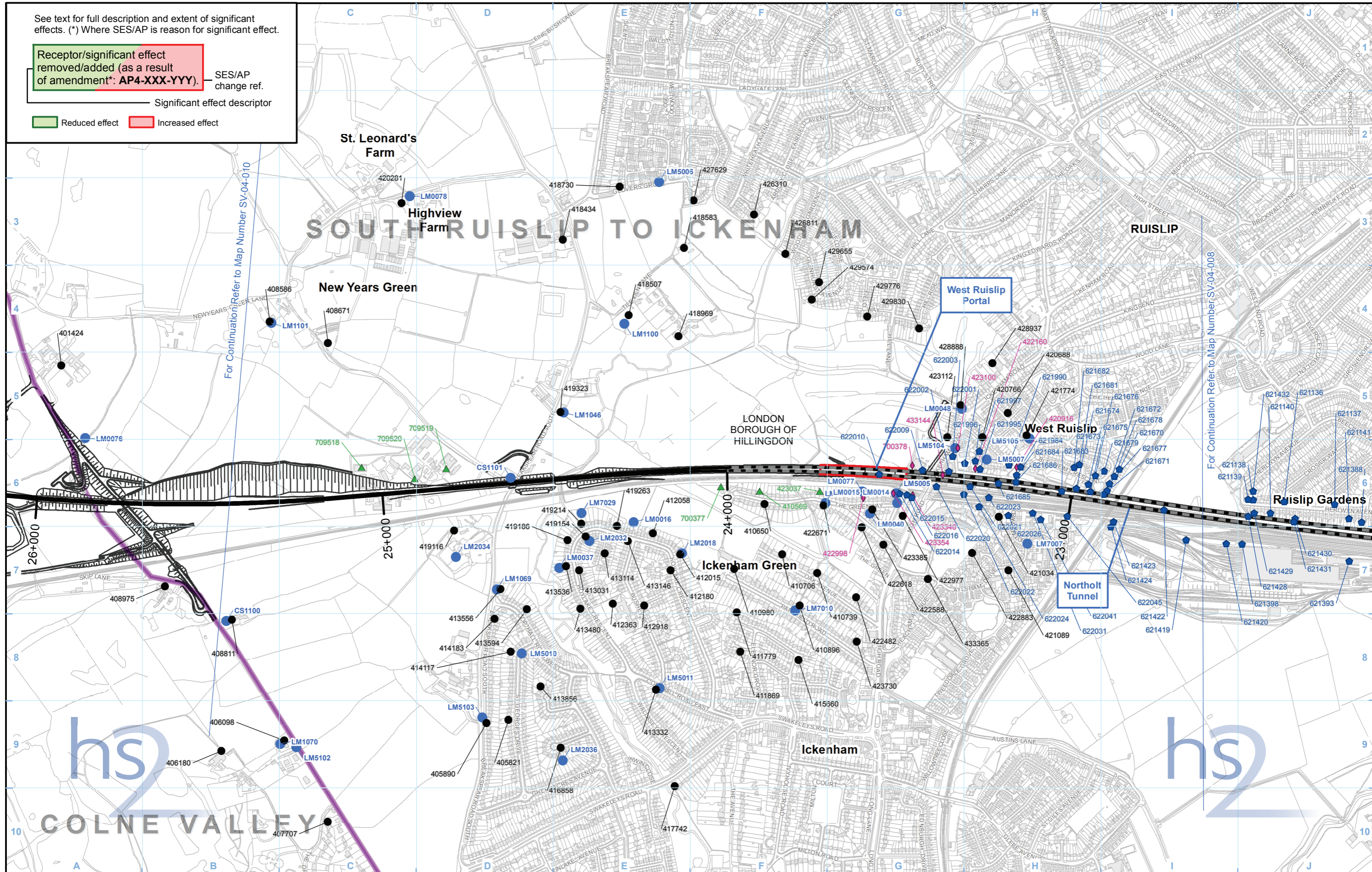
Date: 21/09/15

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number: SV-04-009

Map Name: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA6: South Ruislip to Ickenham

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Doc Number: C250-ARP-EV-MAP-000-002408-AP04-P01

Date: 21/09/15

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HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

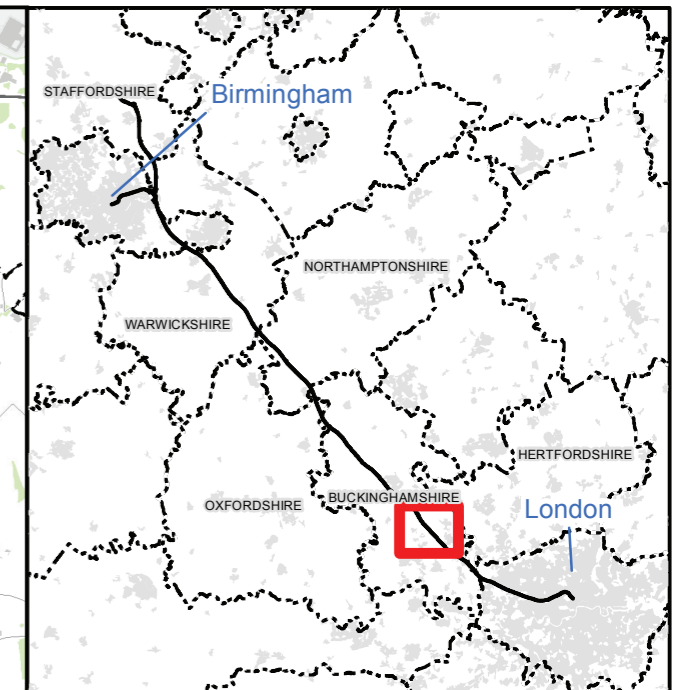
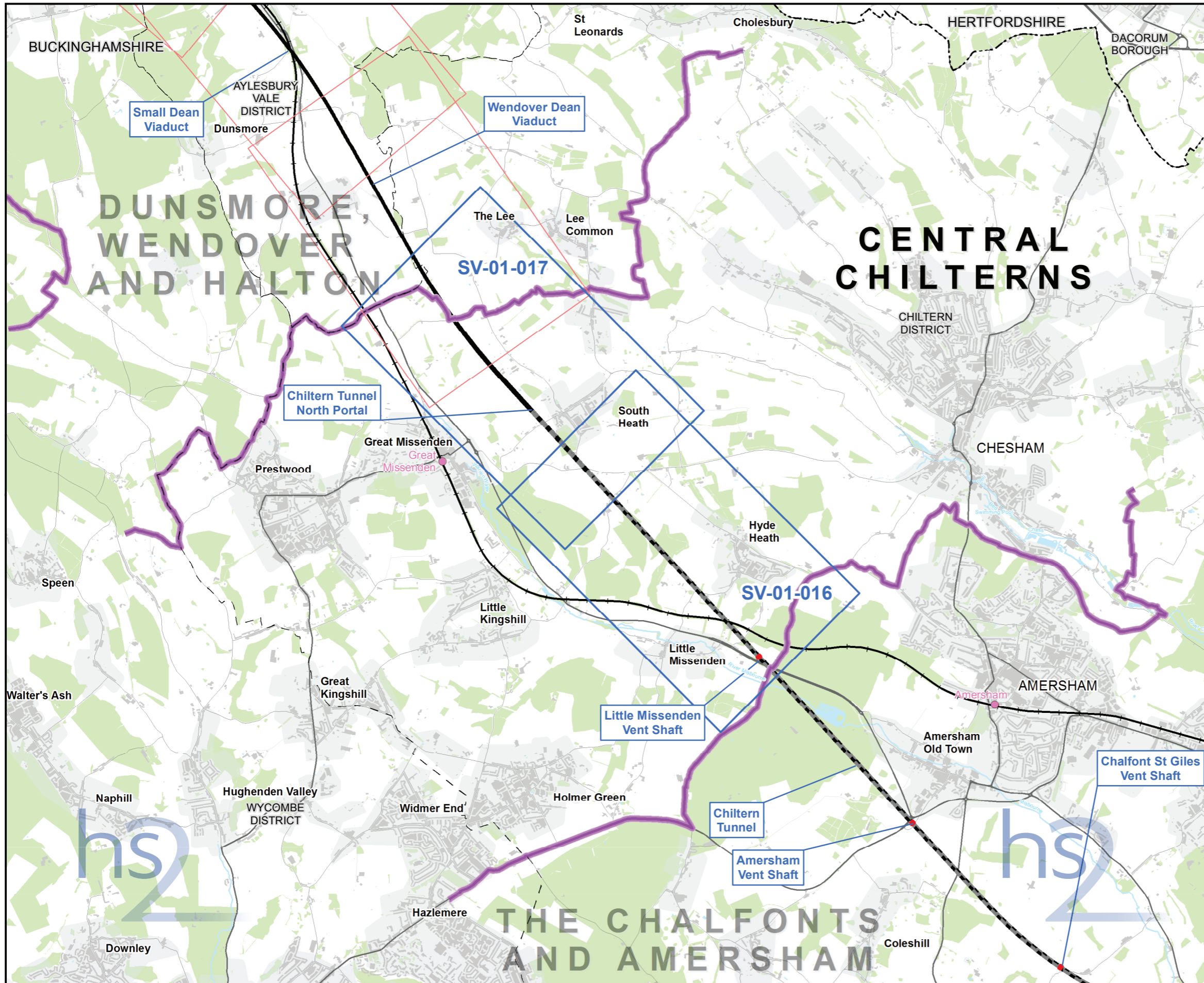
Volume 5 | CFA9 Central Chilterns

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

SV-04 - Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments

October 2015



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CFA9
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES3 and AP4 ES
	Community Forum Area CFA9: Central Chilterns

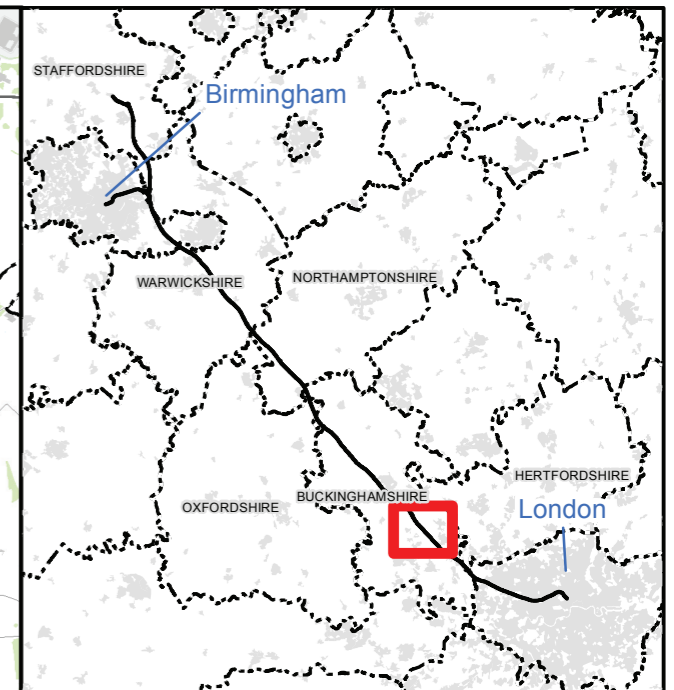
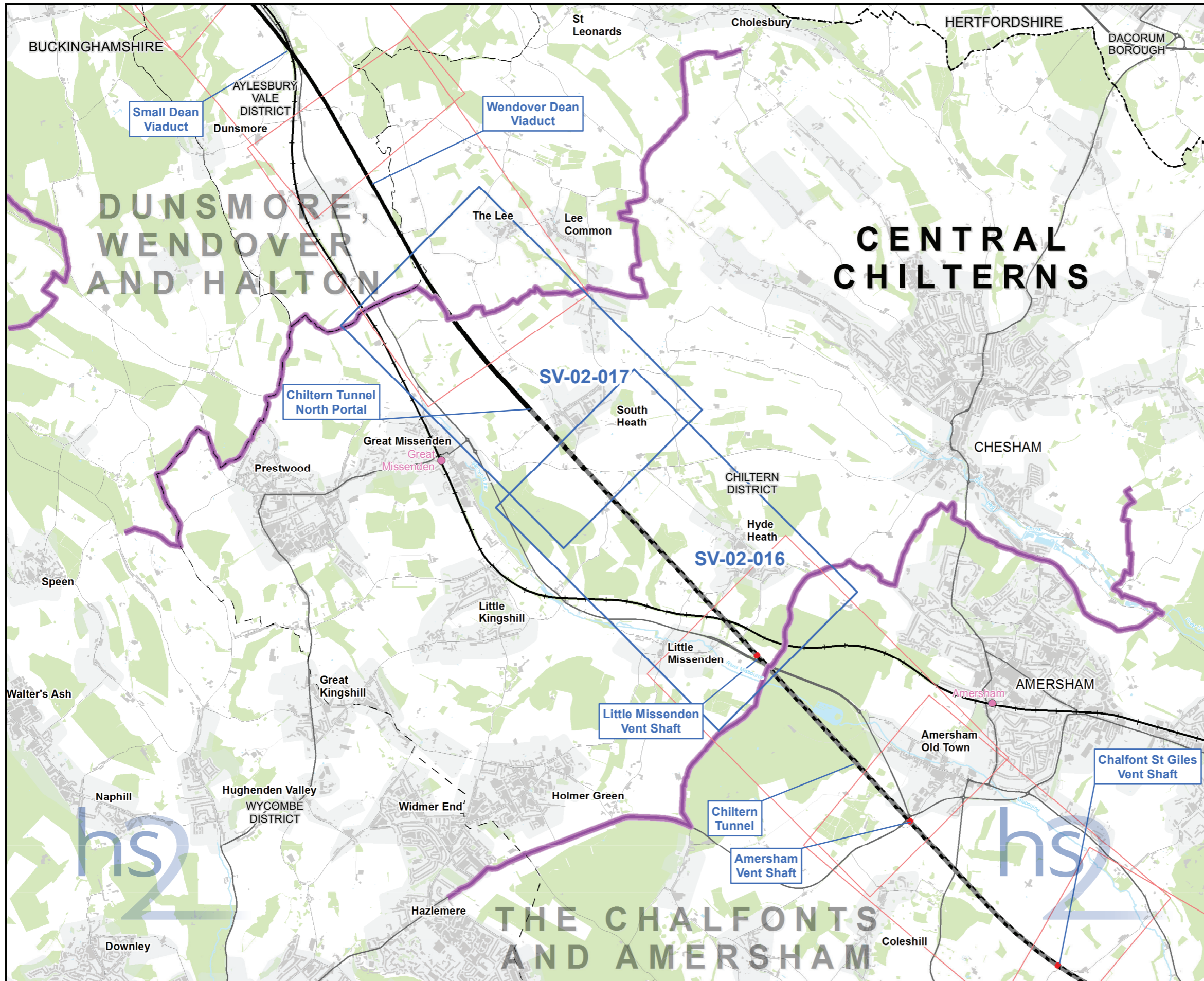
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Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:

- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
- the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
- sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series);
- the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
- labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

	Route in tunnel		Map sheets included in this community forum with amendment
	Route on surface		Map sheets included in this community forum with no amendment
	Depot, station, headhouse or portal building		Map sheets not included in this community forum
	Community forum boundary		
	Existing railway station		
	County boundary		
	District/Borough boundary		

Map Number	SV-02-INDEX-CFA9
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant effects (with Assessment Locations) SES3 and AP4 ES
	Community Forum Area CFA9: Central Chilterns

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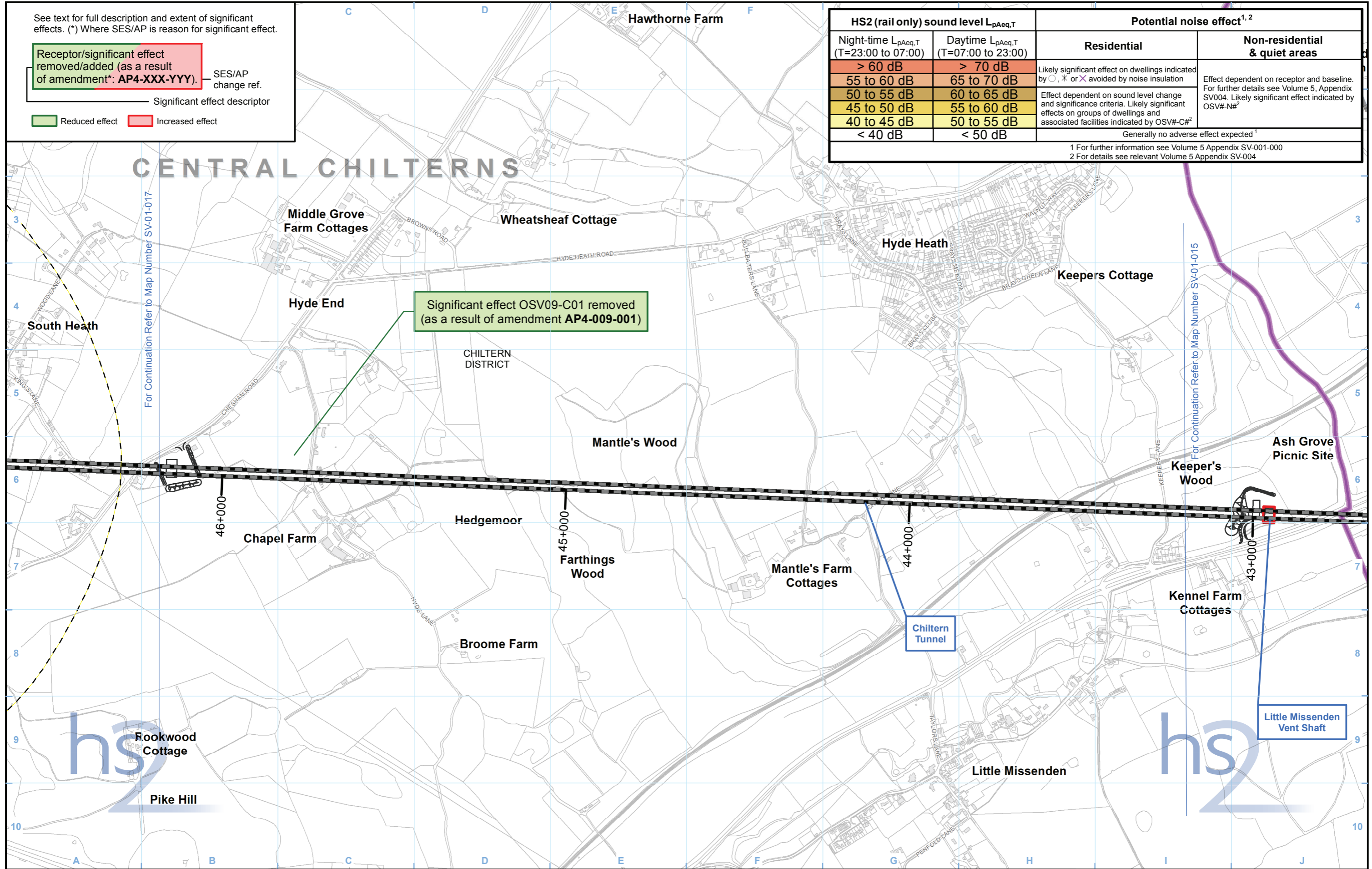
Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect (green box) Increased effect (red box)

HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-016

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA9: Central Chilterns

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Doc Number: C250-ARP-EV-MAP-000-002181-AP04-P01

Date: 17/09/15

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

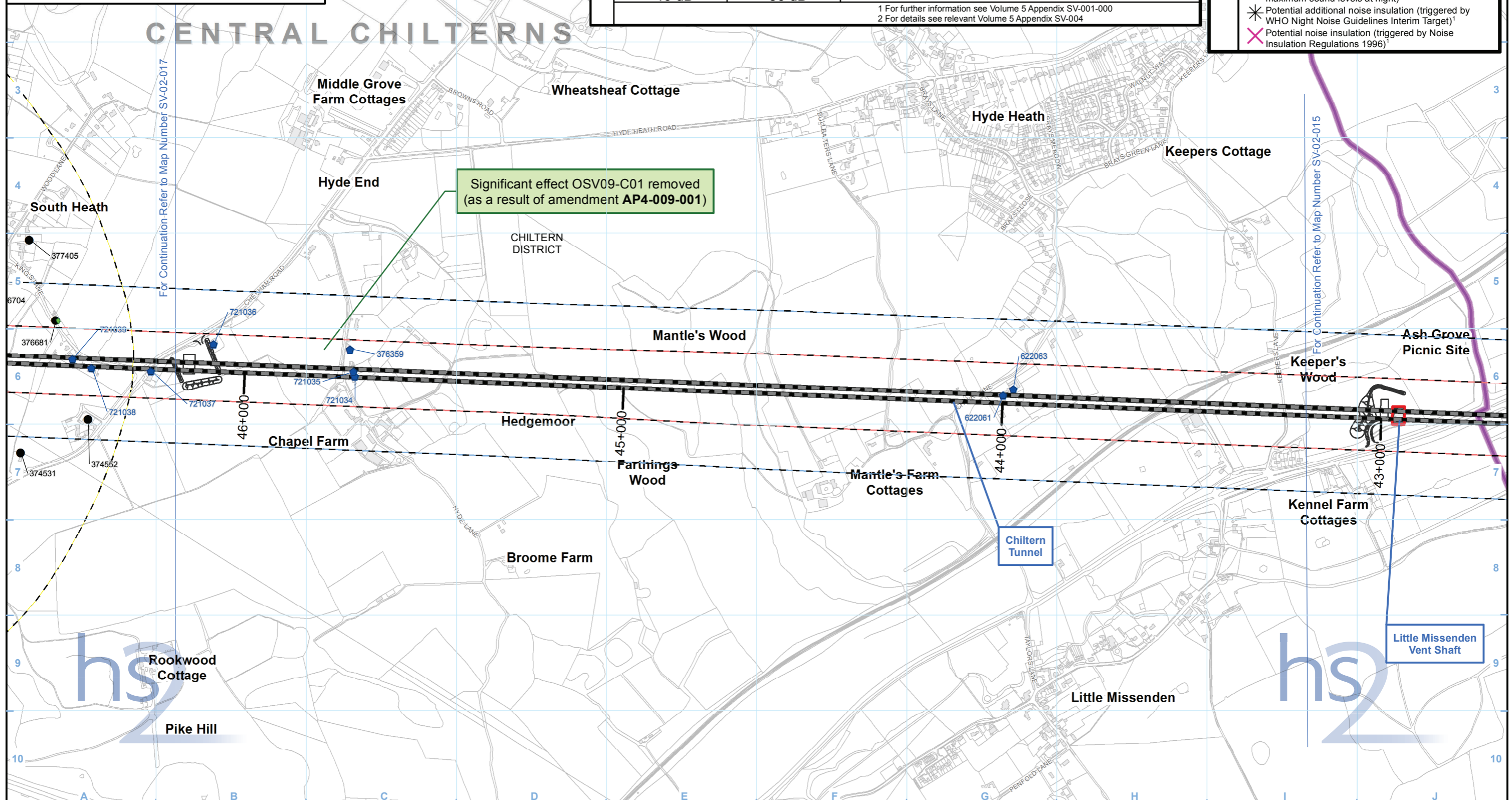
Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.
 Significant effect descriptor
 Reduced effect Increased effect

Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
	40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
 2 For details see relevant Volume 5 Appendix SV-004

Panel B	Operational airborne sound impacts at buildings* Change in sound level ($L_{pAeq,T}$ day / night)	
	Major adverse (>10dB)	Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)	Negligible (-3dB to 3dB)	
Beneficial (<-3dB)		

○ Potential additional noise insulation (triggered by maximum sound levels at night)¹
 * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

+ Residential buildings only
 * Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-016
 Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES
 Community Forum Area CFA9: Central Chilterns

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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY).

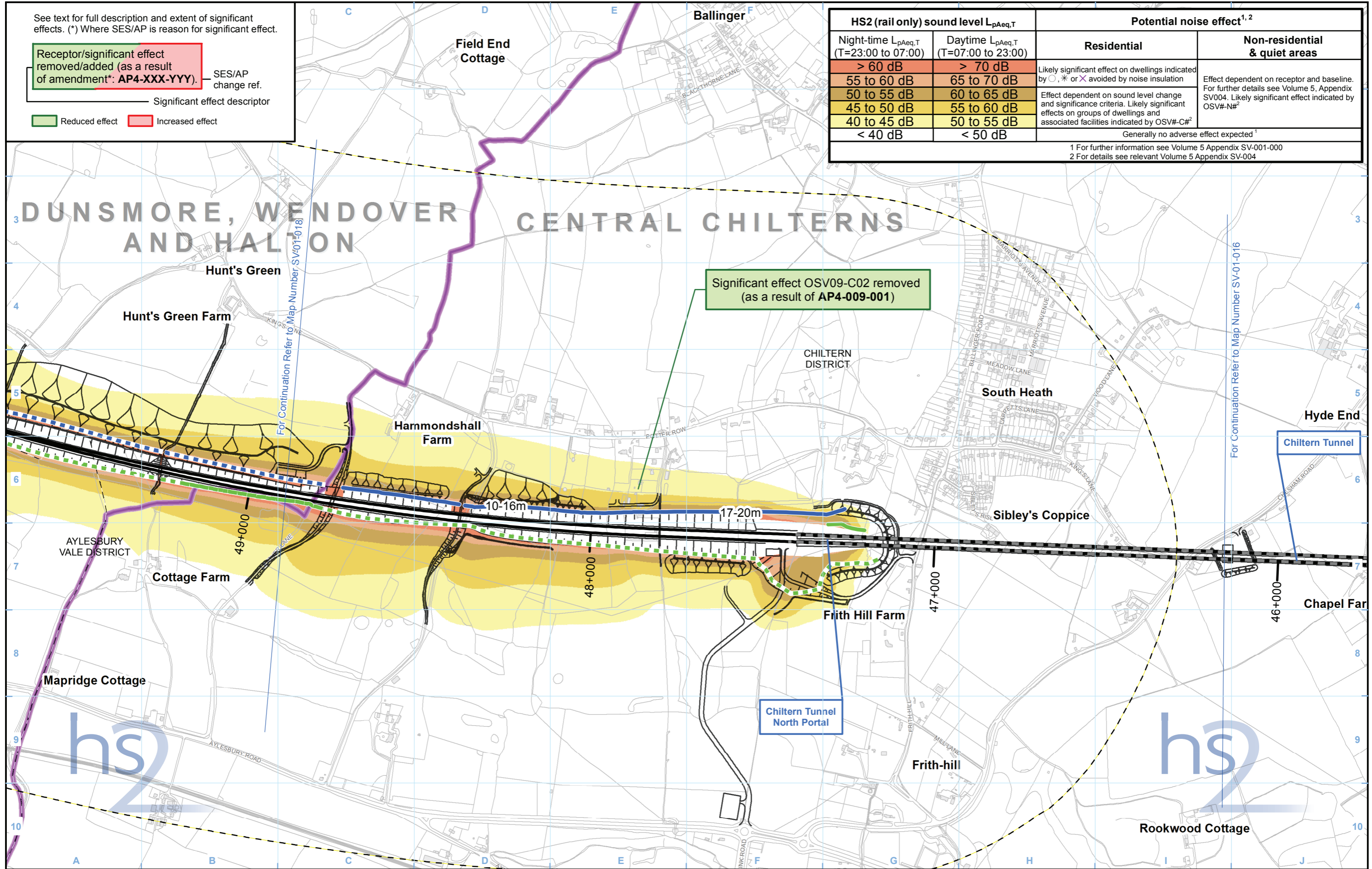
SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect

HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

- Engineering earthworks:
- Embankment
 - Cutting
- Non engineering earthworks:
- Embankment
 - Cutting

Legend - Sound related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-017

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA9: Central Chilterns

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Doc Number: C250-ARP-EV-MAP-000-002182-AP04-P01

Date: 17/09/15

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY).

SES/AP change ref.

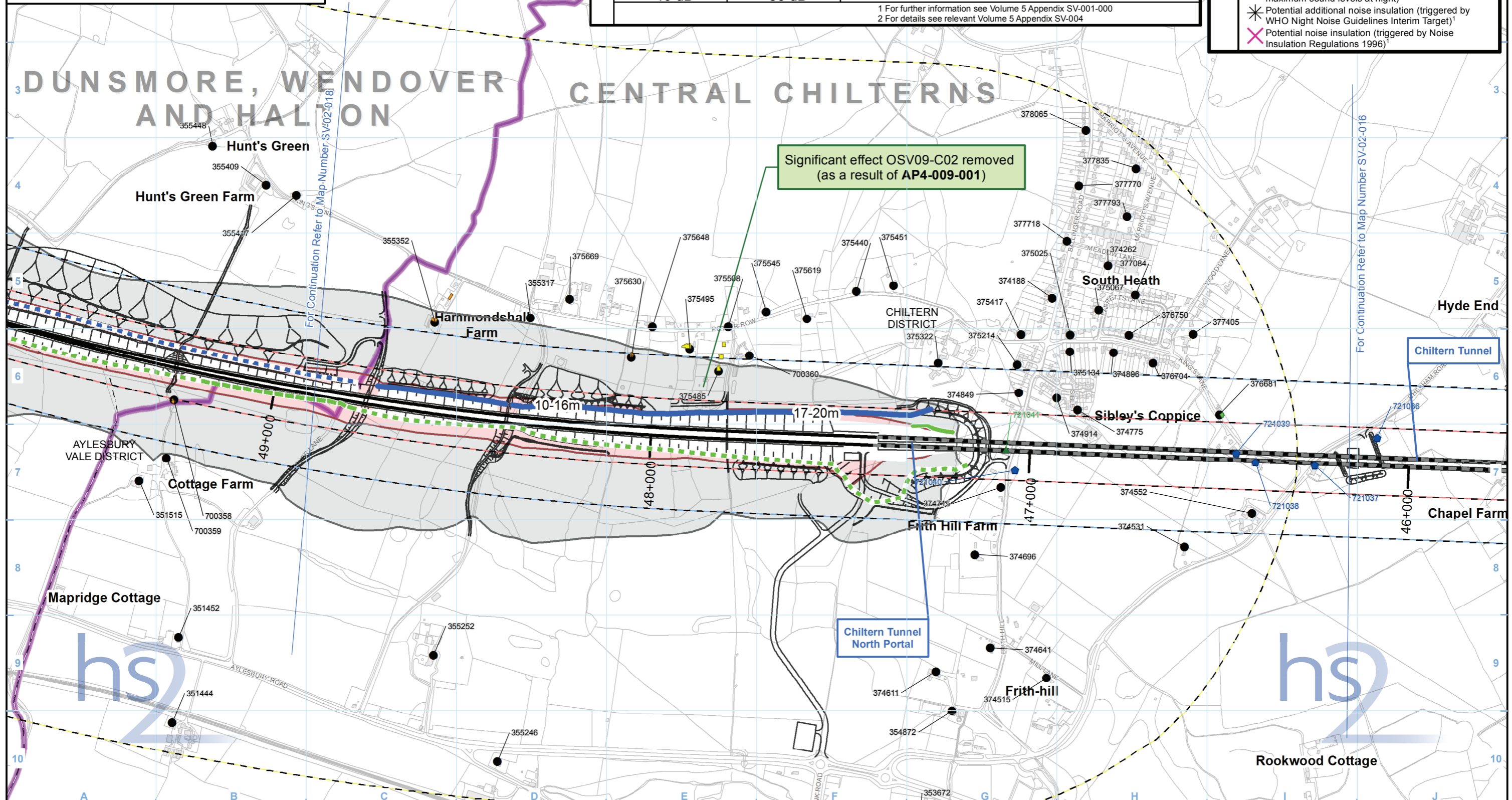
Significant effect descriptor

Reduced effect Increased effect

HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

Operational airborne sound impacts at buildings* Change in sound level (L _{pAeq,T} day / night)	
Major adverse (>10dB)	Potential additional noise insulation (triggered by maximum sound levels at night) ¹
Moderate adverse (5dB to 10dB)	Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹
Minor adverse (3dB to 5dB)	Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹
Negligible (-3dB to 3dB)	
Beneficial (<-3dB)	



Significant effect OSV09-C02 removed (as a result of AP4-009-001)

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:	Non engineering earthworks:
Embankment	Embankment
Cutting	Cutting

* Residential buildings only
* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area

Legend - Sound related features

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-017

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES

Community Forum Area CFA9: Central Chilterns

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Scale at A3: 1:10,000

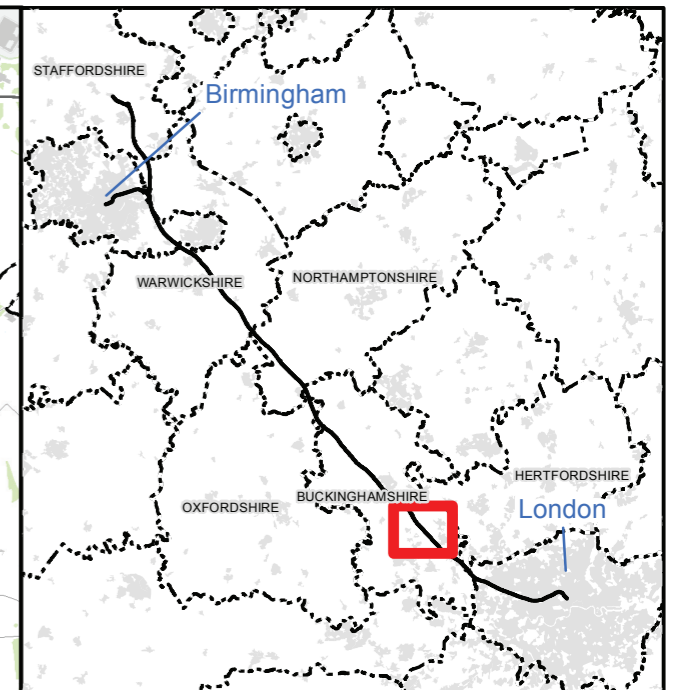
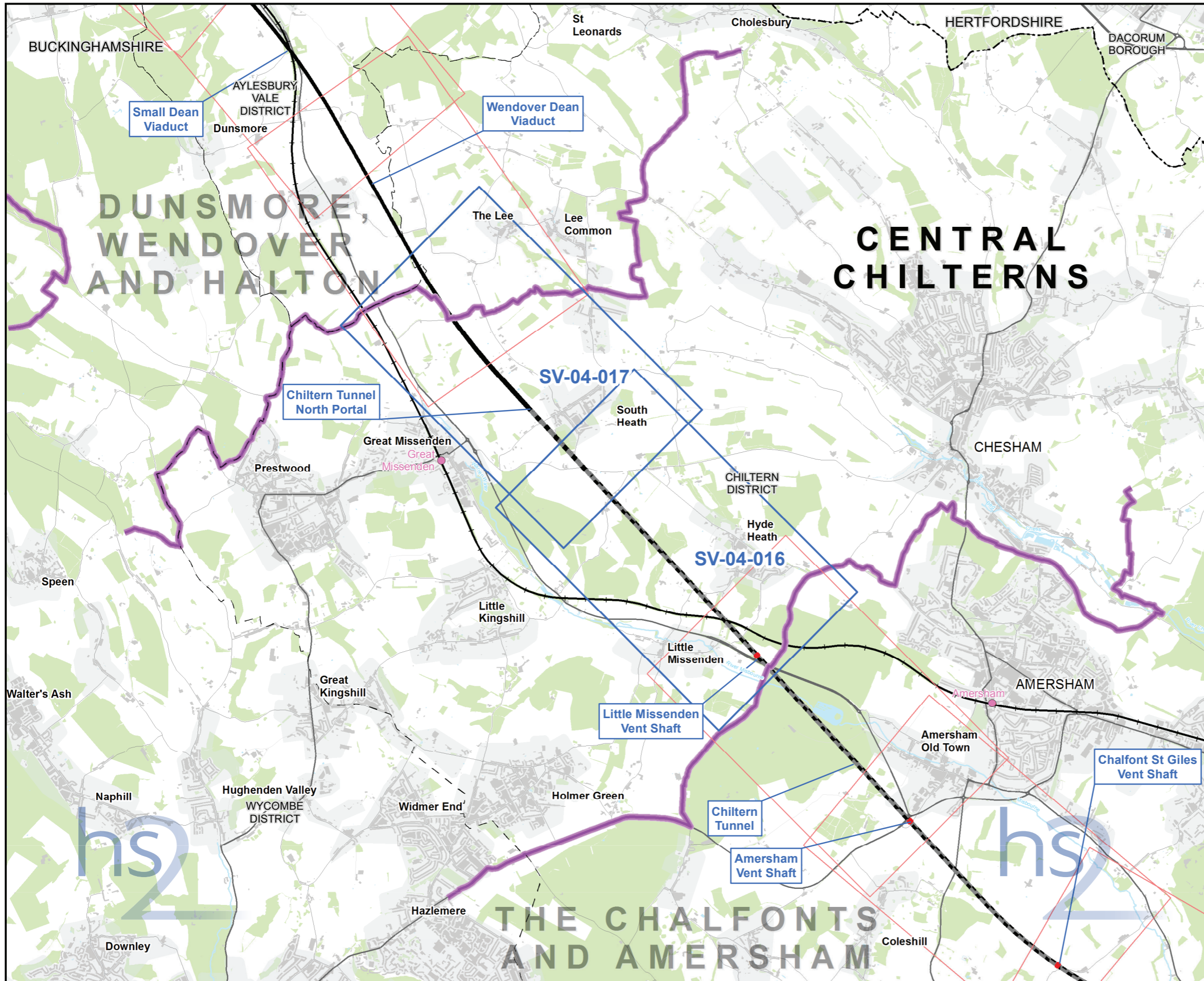
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Map Series Information:

The SV-04 figure series shows the locations at which a quantitative assessment of the direct effects of operational sound and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the operational sound and vibration reports contained in Volume 5: Appendix SV-004 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend	
Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-04-INDEX-CFA9
Map Name	Index Map of: Assessment & Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES3 and AP4 ES
	Community Forum Area CFA9: Central Chilterns

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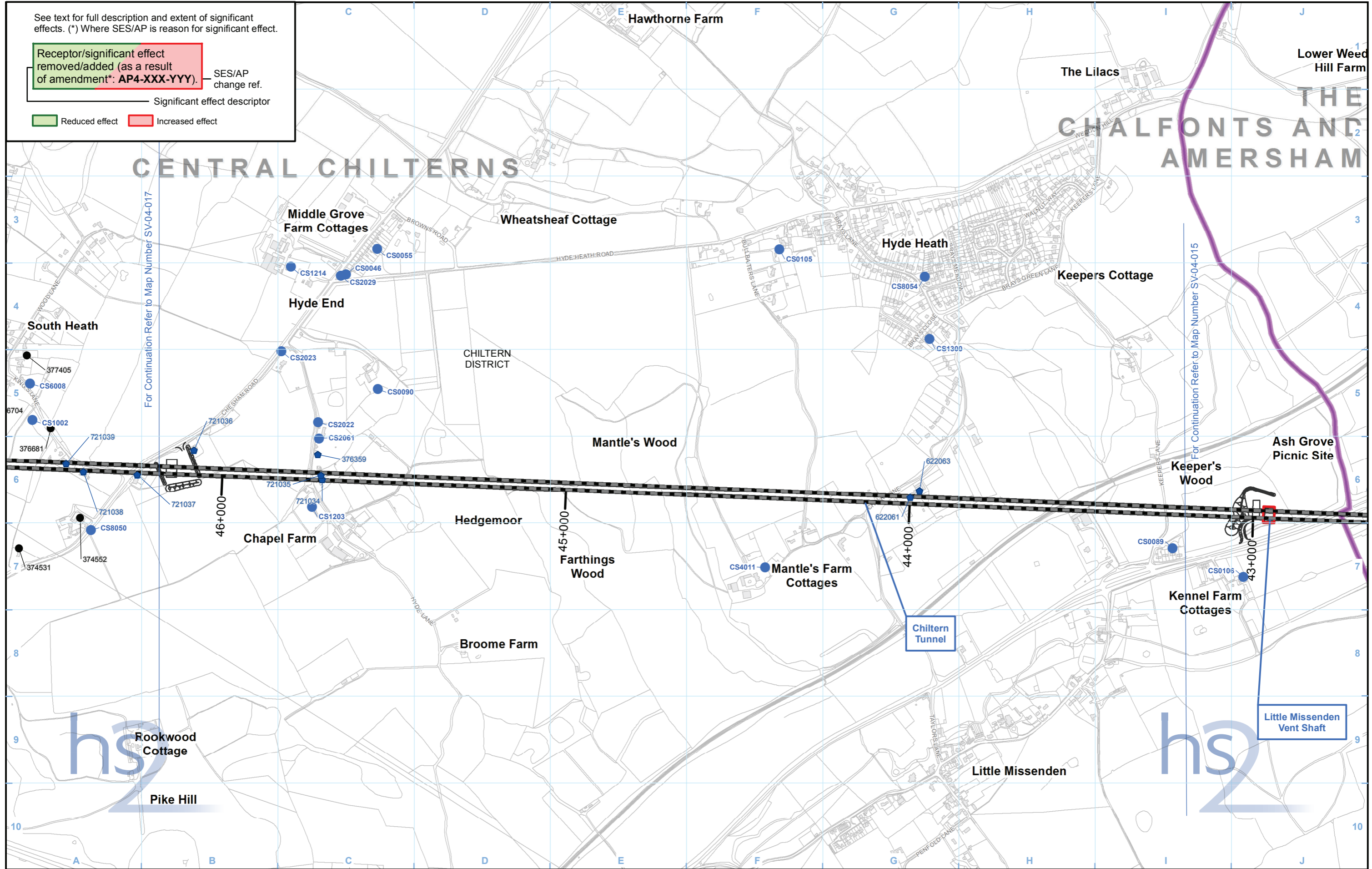
Note: Not all data layers in the legend are represented on every map.

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Embankment
- Cutting

Legend - Sound related features

- Airborne sound assessment location
 - Airborne sound and vibration assessment location
 - Ground-borne sound and/or vibration assessment location
 - Airborne sound, ground-borne sound and vibration assessment location
 - Baseline measurement locations
- labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV004)
- (labelled with Measurement Location reference code)

Map Number SV-04-016

Map Name
Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA9: Central Chilterns

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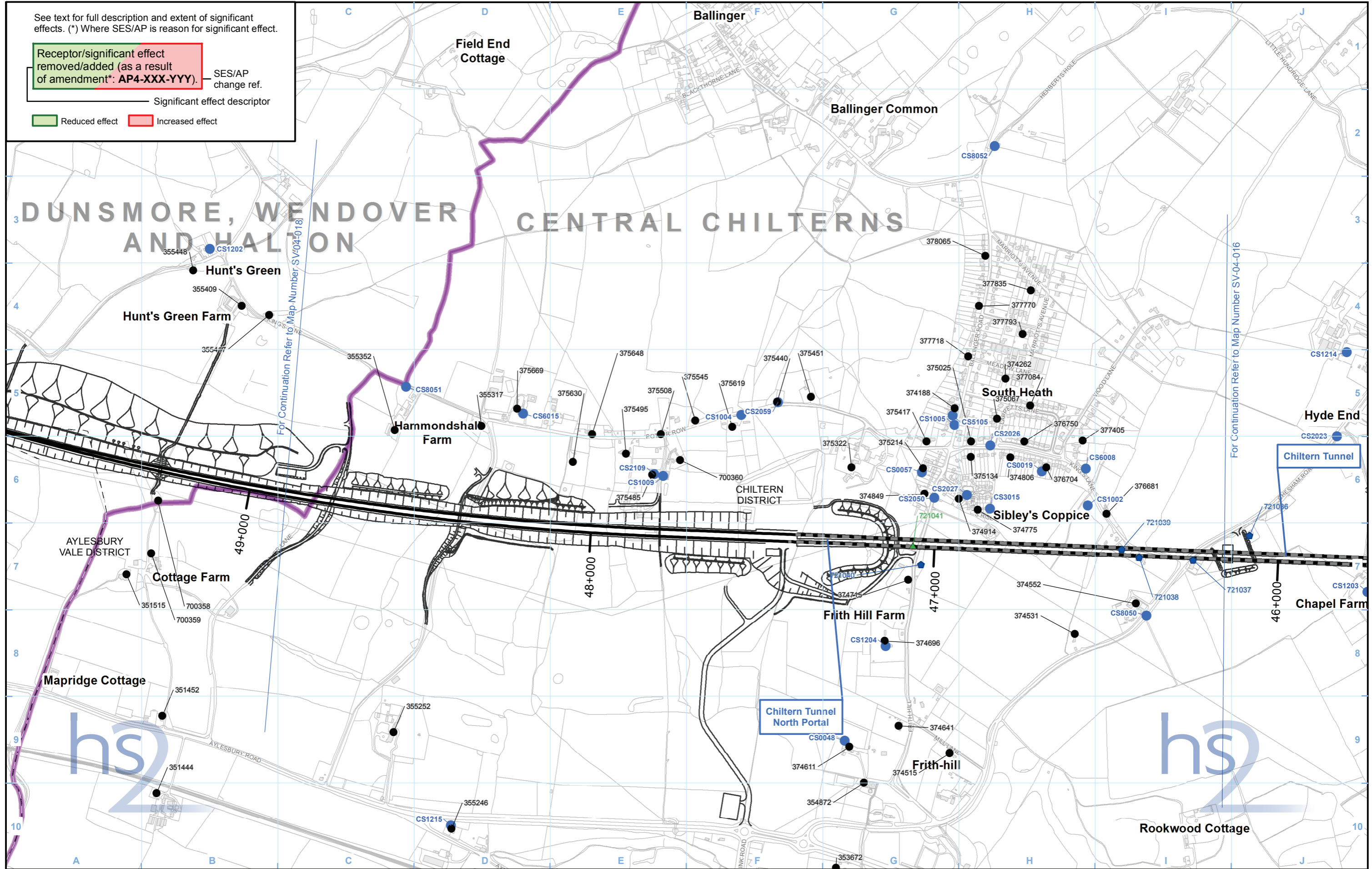
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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:	Non engineering earthworks:
Embankment	Embankment
Cutting	Cutting

Legend - Sound related features

- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV004)

(labelled with Measurement Location reference code)

Map Number: SV-04-017

Map Name: Assessment and Monitoring Locations for Operational Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA9: Central Chilterns

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Doc Number: C250-ARP-EV-MAP-000-002416-AP04-P01

Date: 21/09/15

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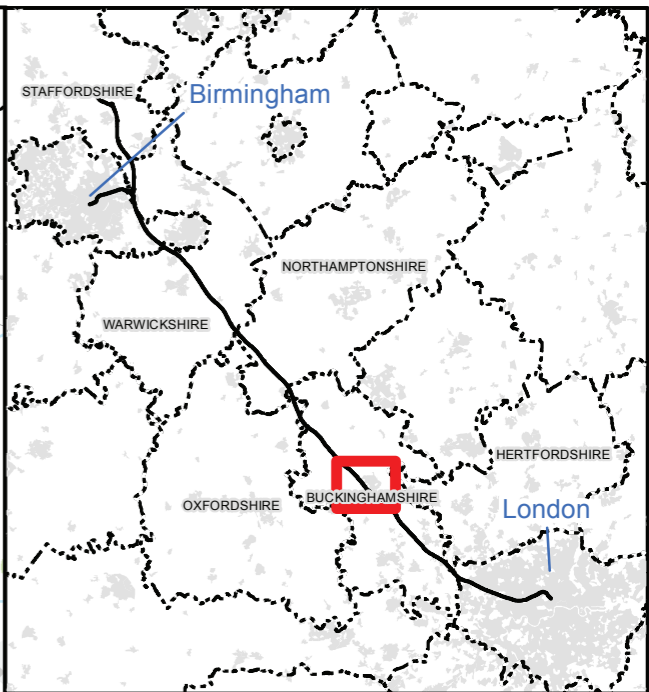
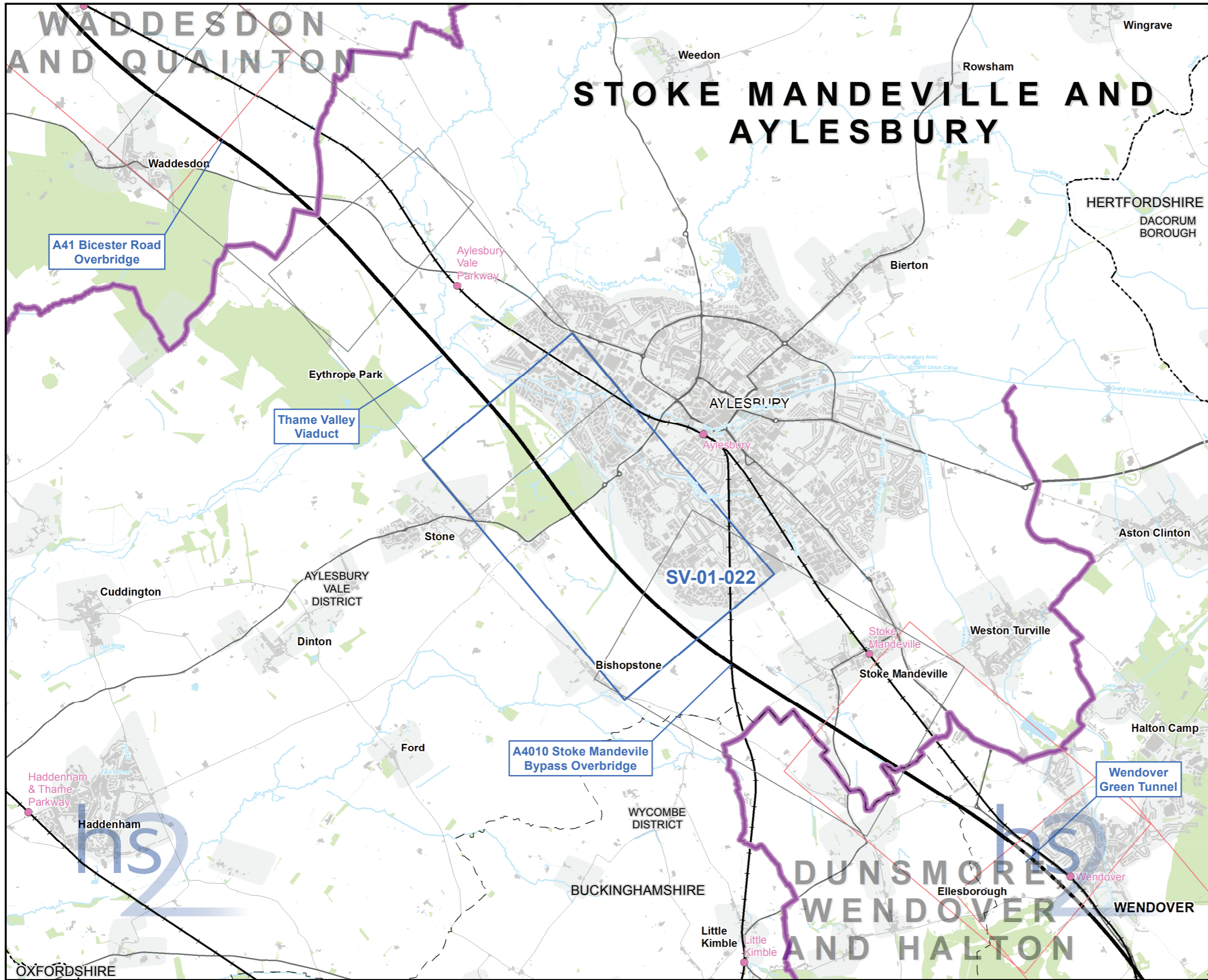
Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 5 | CFA11 Stoke Mandeville and Aylesbury

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

October 2015



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CFA11
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES3 and AP4 ES
Community Forum Area CFA11: Stoke Mandeville and Aylesbury	

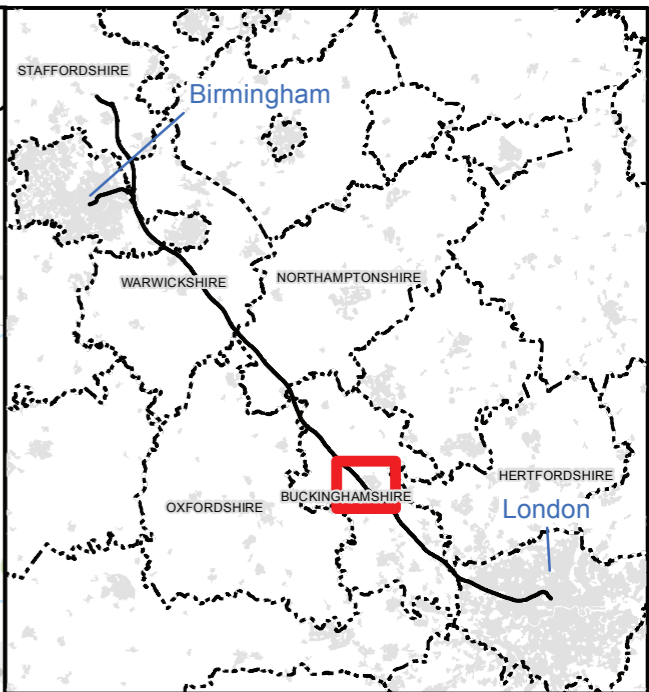
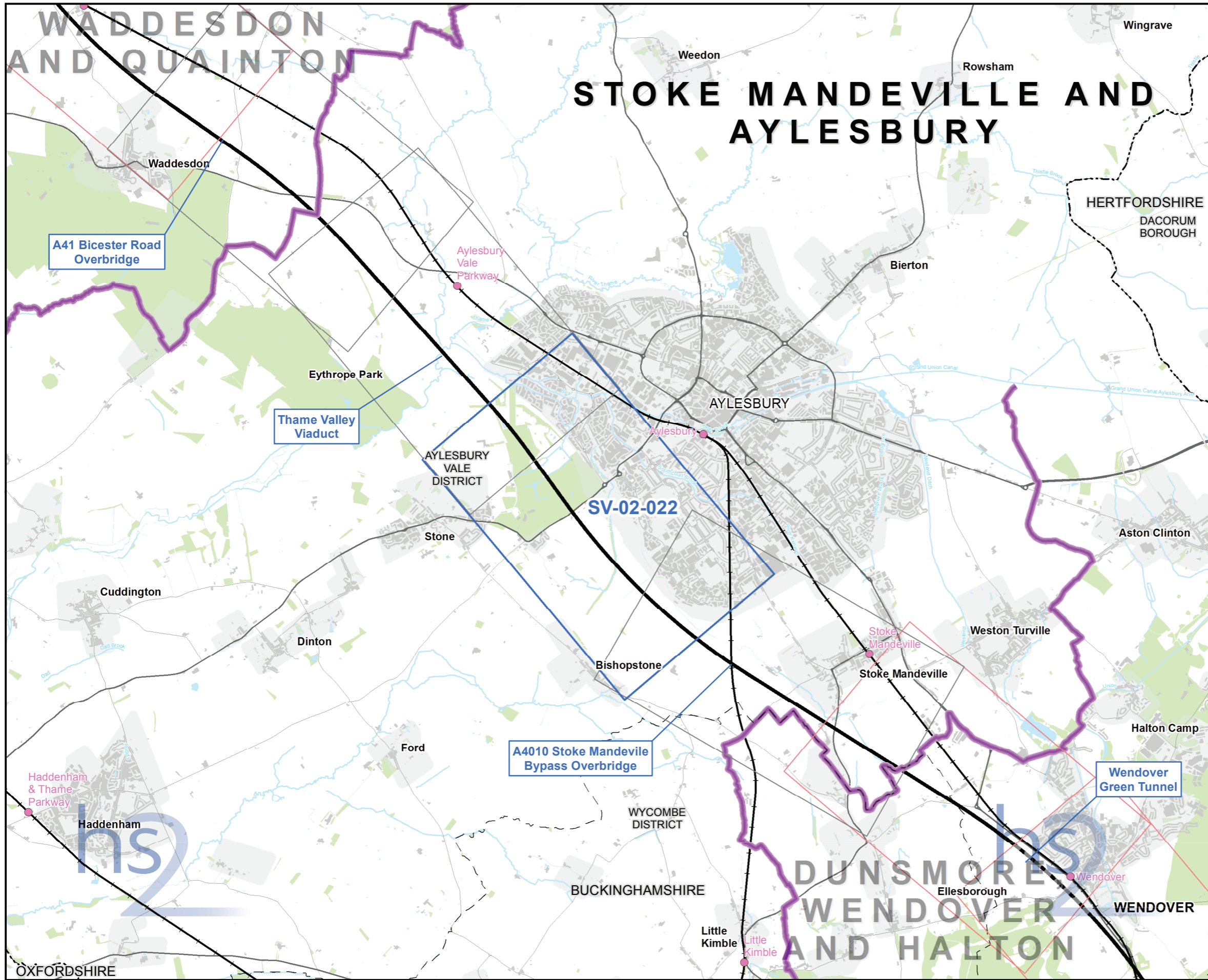
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Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

- Key items on the map include the following:
- The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);
 - blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
 - the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;
 - the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;
 - sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series);
 - the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and
 - labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-02-INDEX-CFA11
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant effects (with Assessment Locations) SES3 and AP4 ES
Community Forum Area CFA11: Stoke Mandeville and Aylesbury	

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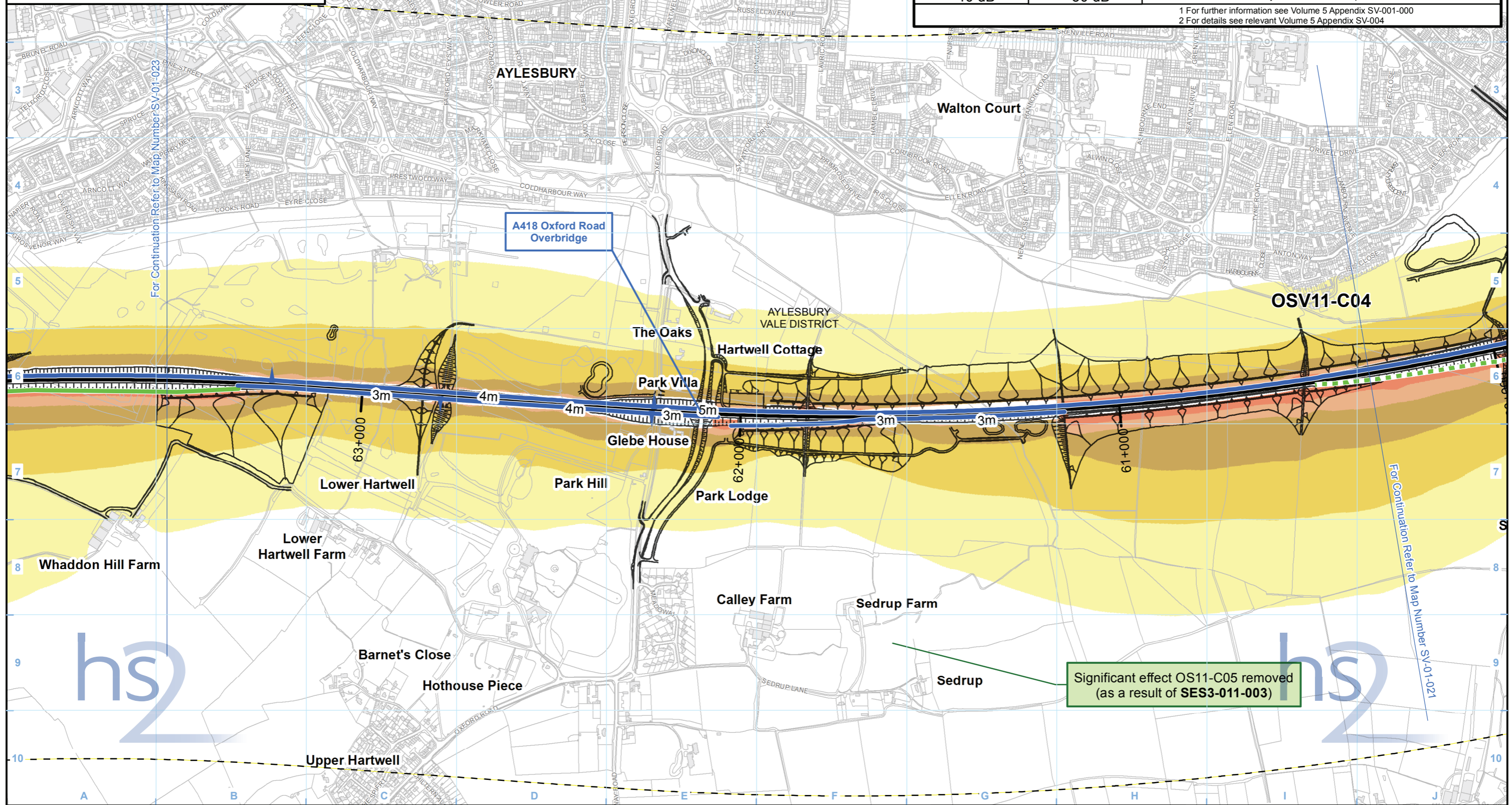
Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect (green) Increased effect (red)

HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Legend - Airborne sound study area

- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-022

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA11: Stoke Mandeville and Aylesbury

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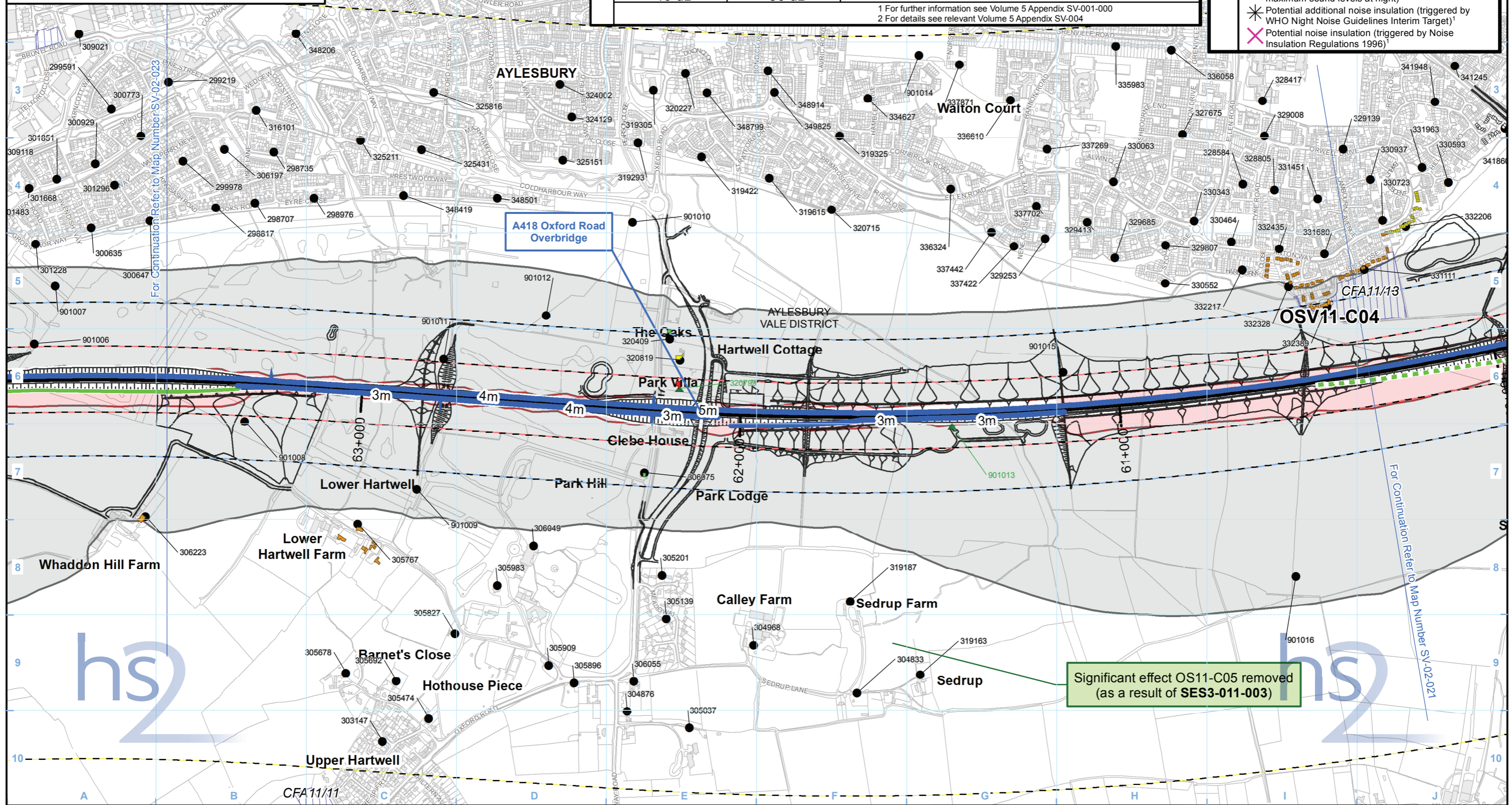
See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). SES/AP change ref. Significant effect descriptor
 Reduced effect Increased effect

Panel A	HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
	Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-C# ²
	40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
 2 For details see relevant Volume 5 Appendix SV-004

Panel B	Operational airborne sound impacts at buildings* Change in sound level (L _{pAeq,T} day / night)	
	Major adverse (>10dB)	Potential additional noise insulation (triggered by maximum sound levels at night) ¹
	Moderate adverse (5dB to 10dB)	Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹
	Minor adverse (3dB to 5dB)	Potential noise insulation (triggered by Noise Insulation Regulations 1996)
Negligible (-3dB to 3dB)		
Beneficial (<-3dB)		



Legend - General features
 Route in bored tunnel
 Route in green tunnel
 Route on surface
 Depot, station, headhouse or portal building
 Community forum boundary
 District/Borough boundary
 County boundary

Engineering earthworks:
 Embankment
 Cutting
 Non engineering earthworks:
 Embankment
 Cutting
 * Residential buildings only
 * Labelled with total barrier height above rail level

Legend - Sound related features
 Committed developments (label as CFA#/#) - SV Only
 Envisaged mitigation to avoid / reduce significant noise effects:
 Landscaping and/or fence barriers*
 Engineering e.g. cuttings (green tunnels separately marked)
 Envisaged measures further reducing noise effects:
 Other environmental e.g. landscaping
 Engineering e.g. cuttings
 Airborne sound study area

Ground-borne sound & vibration study area (residential and non-residential)
 Ground-borne sound & vibration study area (highly sensitive non-residential)
 Airborne sound assessment location
 Airborne sound and vibration assessment location
 Ground-borne sound and/or vibration assessment location
 Airborne sound, ground-borne sound and vibration assessment location
 Minor ground-borne noise or vibration impact*

Map Number: SV-02-022
 Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES
 Community Forum Area CFA11: Stoke Mandeville and Aylesbury

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HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

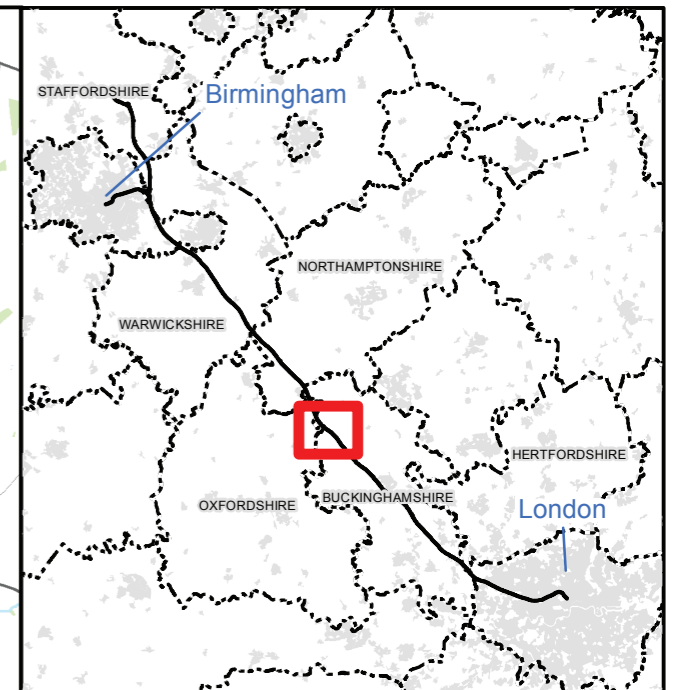
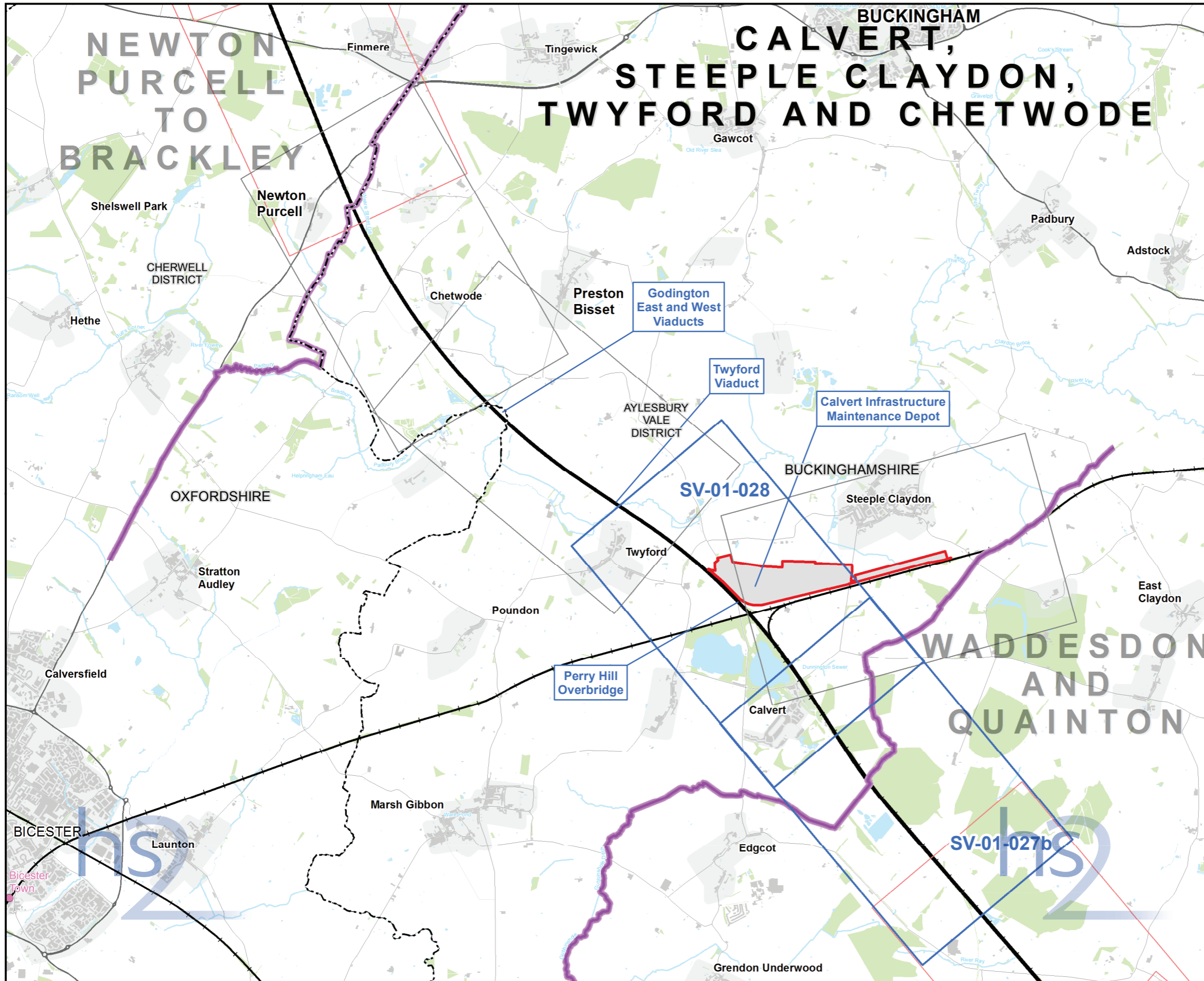
Volume 5 | CFA13 Calvert, Steeple Claydon, Twyford and Chetwode

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

October 2015



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CFA13
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES3 and AP4 ES
Community Forum Area CFA13: Calvert, Steeple Claydon, Twyford and Chetwode	

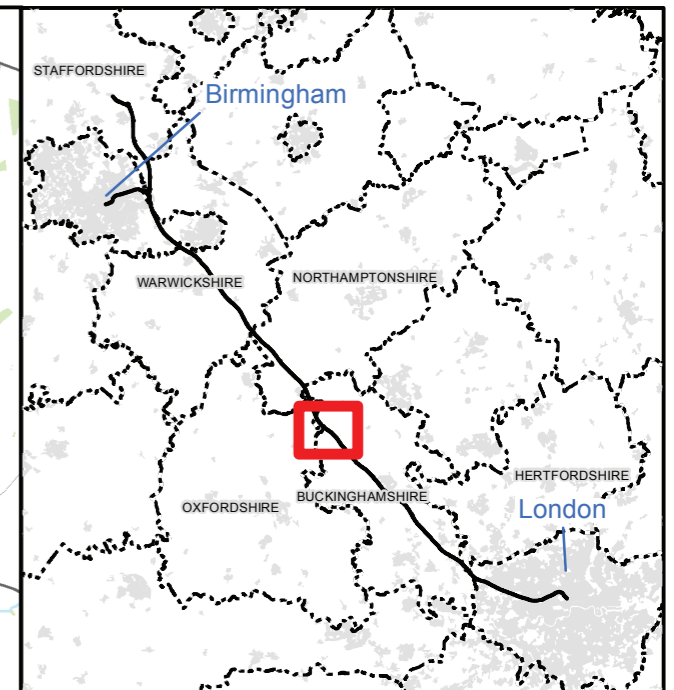
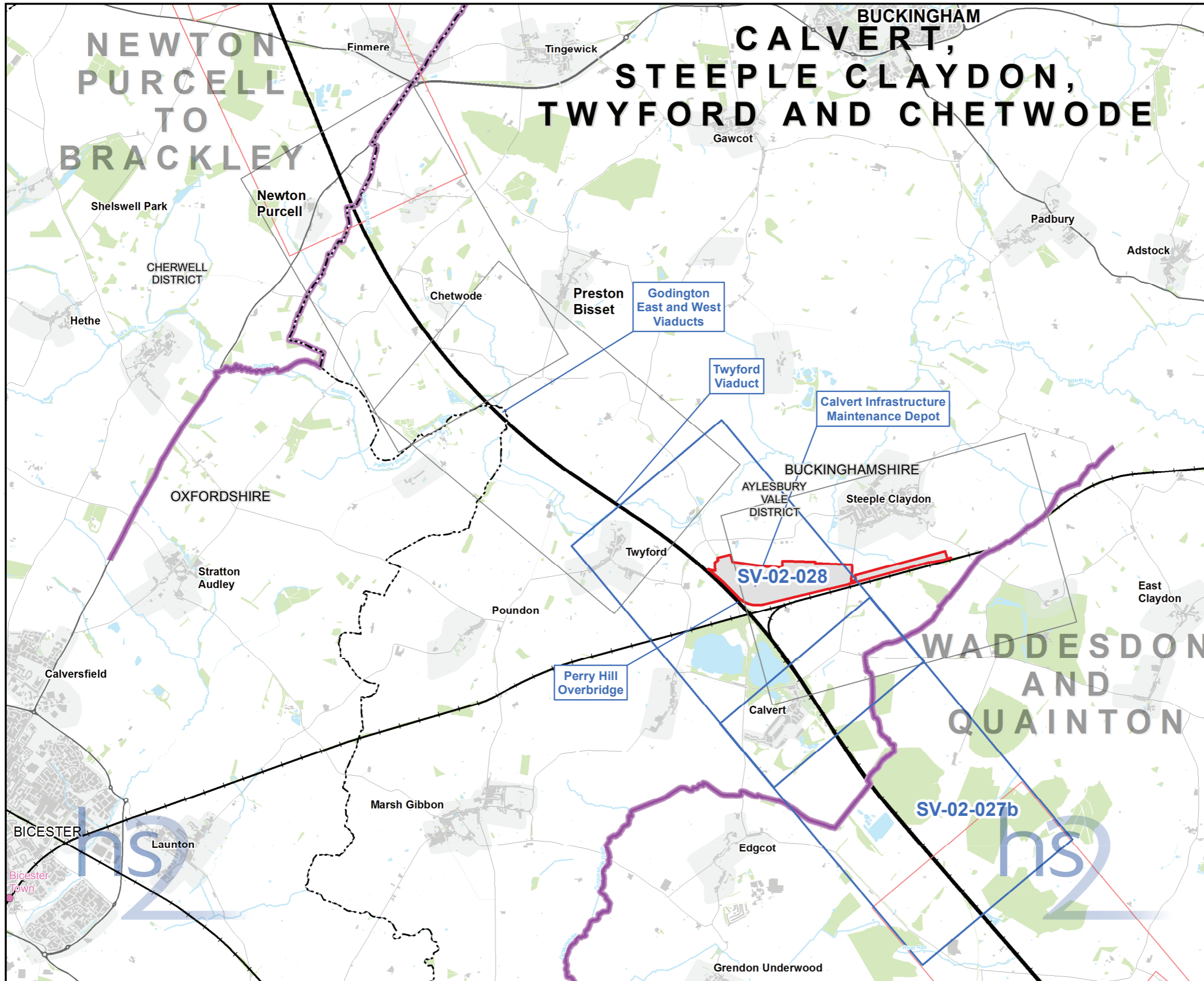
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Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:
 • The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);

• blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;

• the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;

• the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;

• sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series);

• the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and

• labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-02-INDEX-CFA13
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant effects (with Assessment Locations) SES3 and AP4 ES
Community Forum Area CFA13: Calvert, Steeple Claydon, Twyford and Chetwode	

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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

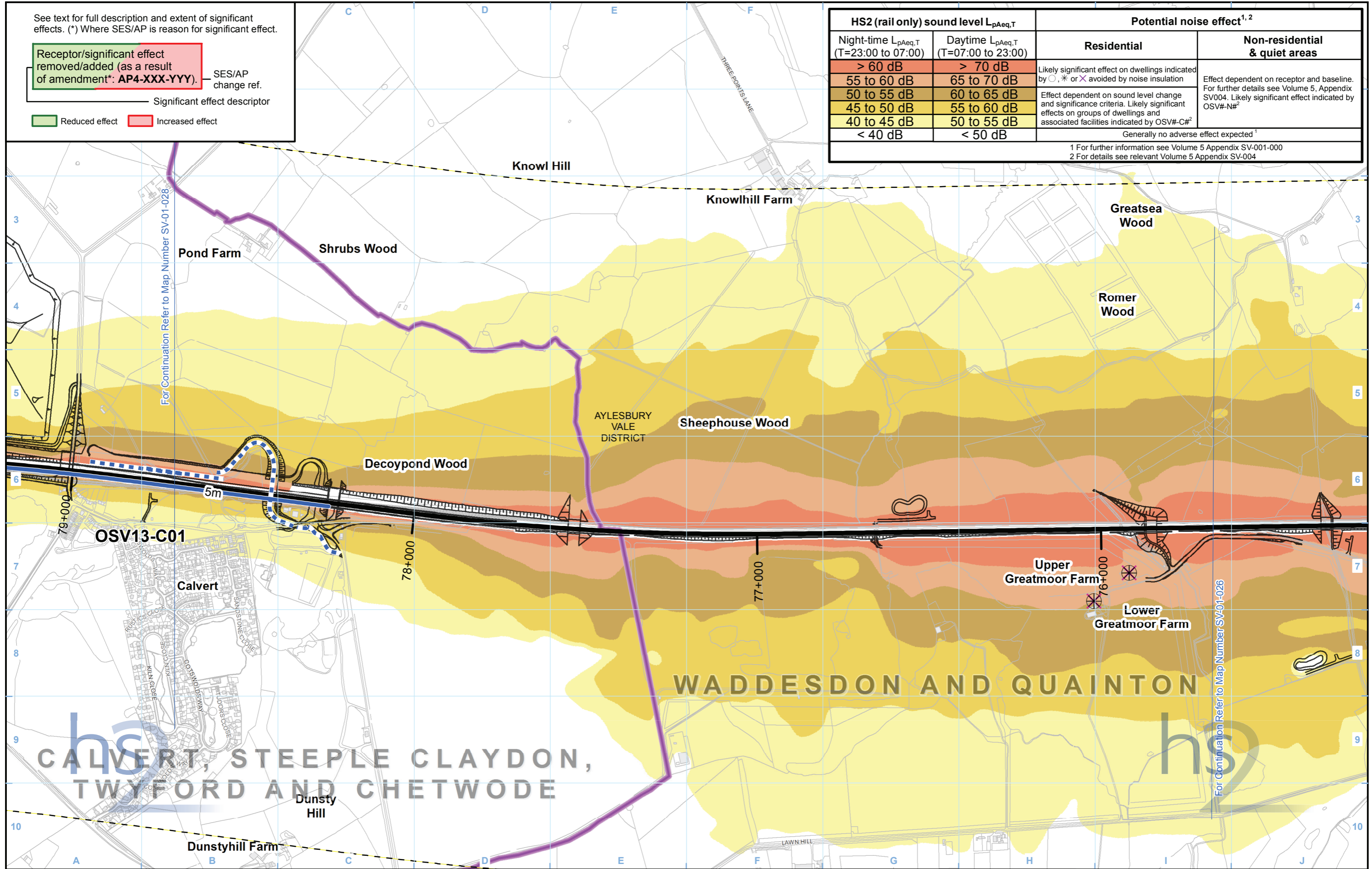
Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect

HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Other symbols:

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-027b

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA13: Calvert, Steeple Claydon, Twyford and Chetwode

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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

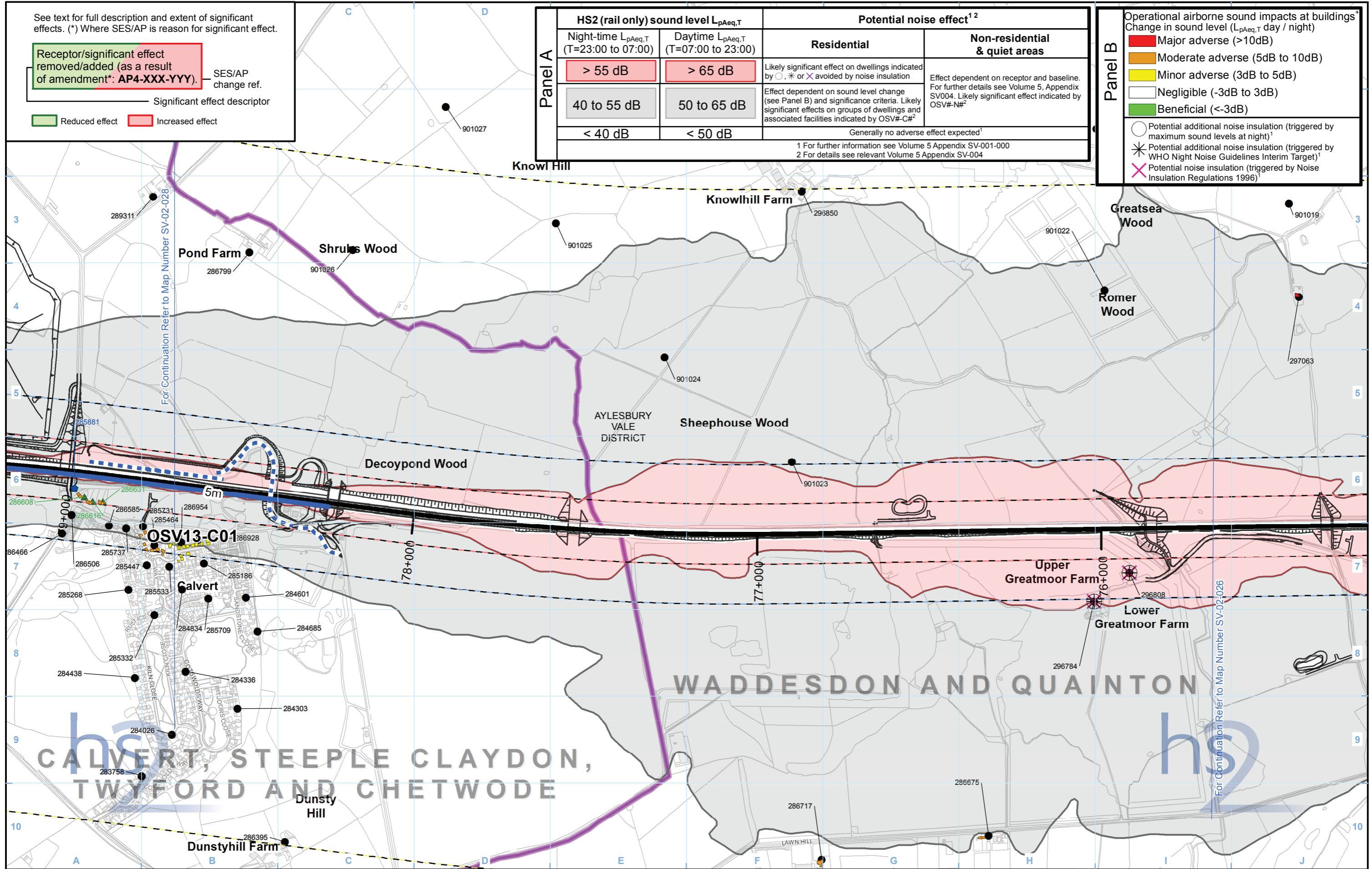
Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). - SES/AP change ref.
 Significant effect descriptor
 Reduced effect Increased effect

Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
	40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
 2 For details see relevant Volume 5 Appendix SV-004

Panel B	Operational airborne sound impacts at buildings* Change in sound level ($L_{pAeq,T}$ day / night)	
	Major adverse (>10dB)	Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)	Negligible (-3dB to 3dB)	
Beneficial (<-3dB)		

○ Potential additional noise insulation (triggered by maximum sound levels at night)¹
 * Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 ✕ Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹



Legend - General features	
Route in bored tunnel	Engineering earthworks: Embankment
Route in green tunnel	Non engineering earthworks: Embankment
Route on surface	Cutting
Depot, station, headhouse or portal building	
Community forum boundary	
District/Borough boundary	
County boundary	

+ Residential buildings only
 * Labelled with total barrier height above rail level

Legend - Sound related features	
Committed developments (label as CFA#/#) - SV Only	Ground-borne sound & vibration study area (residential and non-residential)
Envisaged mitigation to avoid / reduce significant noise effects: Landscaping and/or fence barriers*	Ground-borne sound & vibration study area (highly sensitive non-residential)
Engineering e.g. cuttings (green tunnels separately marked)	Airborne sound assessment location
Other environmental e.g. landscaping	Airborne sound and vibration assessment location
Engineering e.g. cuttings	Ground-borne sound and/or vibration assessment location
Airborne sound study area	Airborne sound, ground-borne sound and vibration assessment location
	Minor ground-borne noise or vibration impact*

Map Number: SV-02-027b
 Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES
 Community Forum Area CFA13: Calvert, Steeple Claydon, Twyford and Chetwode

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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY).

SES/AP change ref.

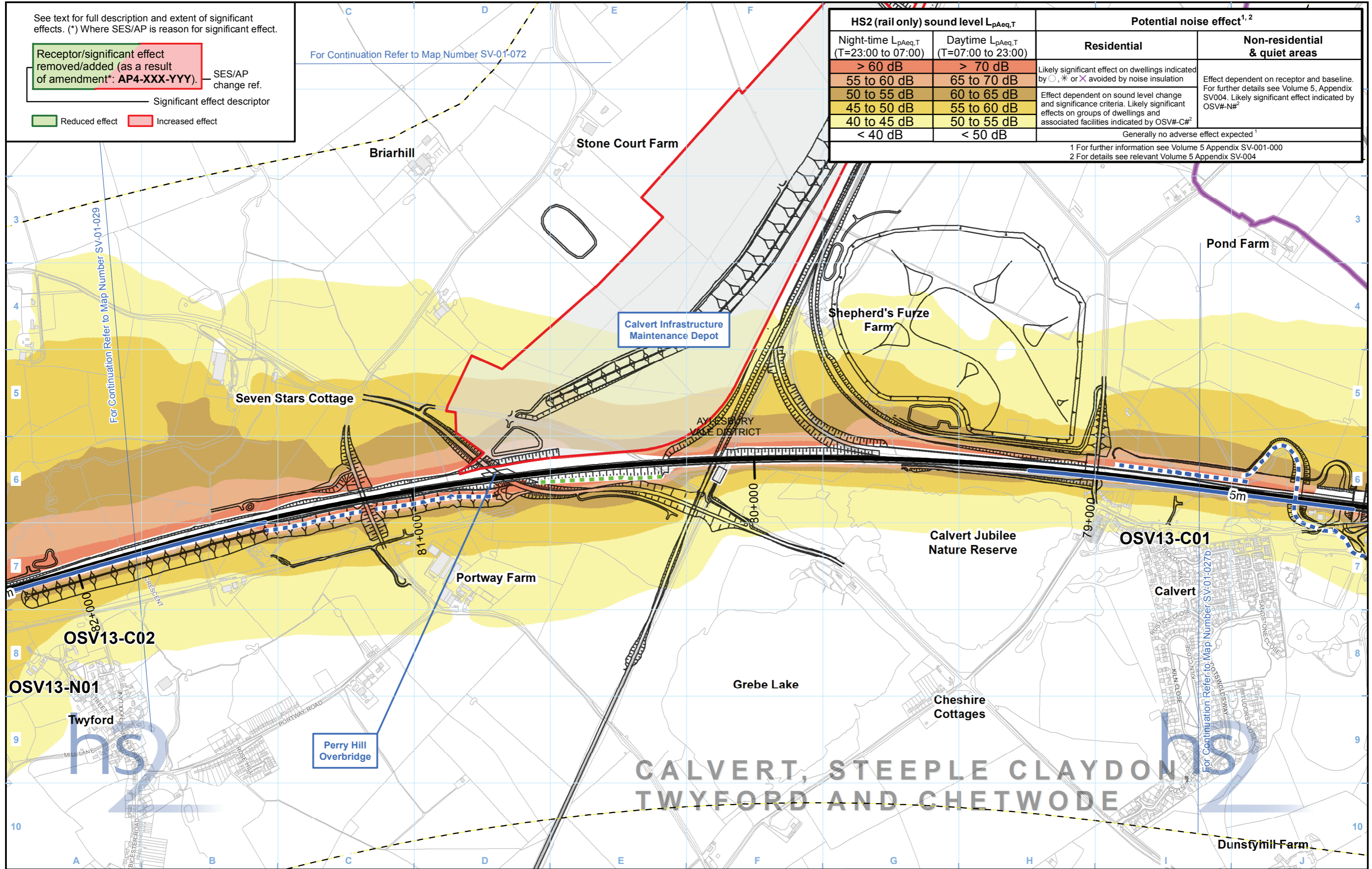
Significant effect descriptor

Reduced effect Increased effect

For Continuation Refer to Map Number SV-01-072

HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Embankment
- Cutting

Legend - Sound related features

- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

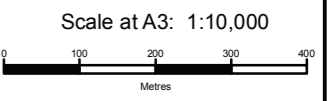
Map Number SV-01-028

Map Name
Operational Sound Contour maps and Likely Significant Effects
SES3 and AP4 ES

Community Forum Area CFA13:
Calvert, Steeple Claydon, Twyford and Chetwode



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Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY).

SES/AP change ref.

Significant effect descriptor

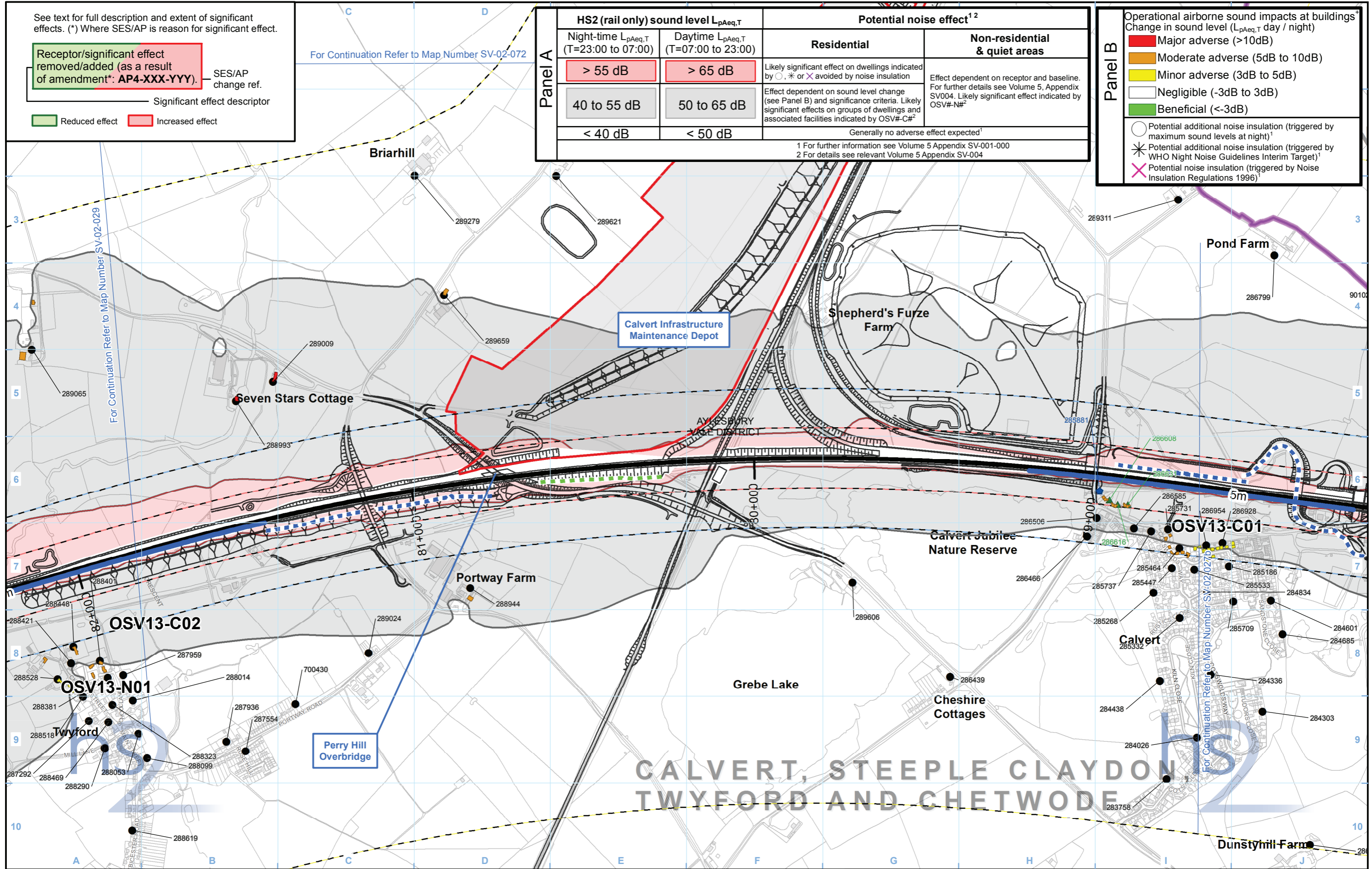
Reduced effect Increased effect

For Continuation Refer to Map Number SV-02-072

Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²		
< 40 dB	< 50 dB	Generally no adverse effect expected ¹		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

Panel B	Operational airborne sound impacts at buildings* Change in sound level ($L_{pAeq,T}$ day / night)			
	Major adverse (>10dB)	Moderate adverse (5dB to 10dB)	Minor adverse (3dB to 5dB)	Negligible (-3dB to 3dB)
Beneficial (<-3dB)				
○	Potential additional noise insulation (triggered by maximum sound levels at night) ¹			
*	Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹			
X	Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹			



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:	Non engineering earthworks:
Embankment	Embankment
Cutting	Cutting

* Residential buildings only
* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
 - Other environmental e.g. landscaping
- Envisaged measures further reducing noise effects:
 - Engineering e.g. cuttings
 - Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-028

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES

Community Forum Area CFA13: Calvert, Steeple Claydon, Twyford and Chetwode

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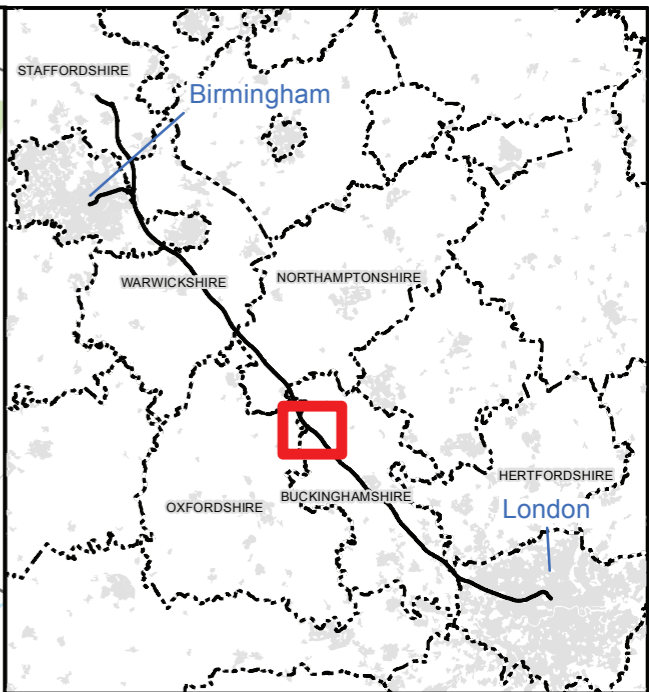
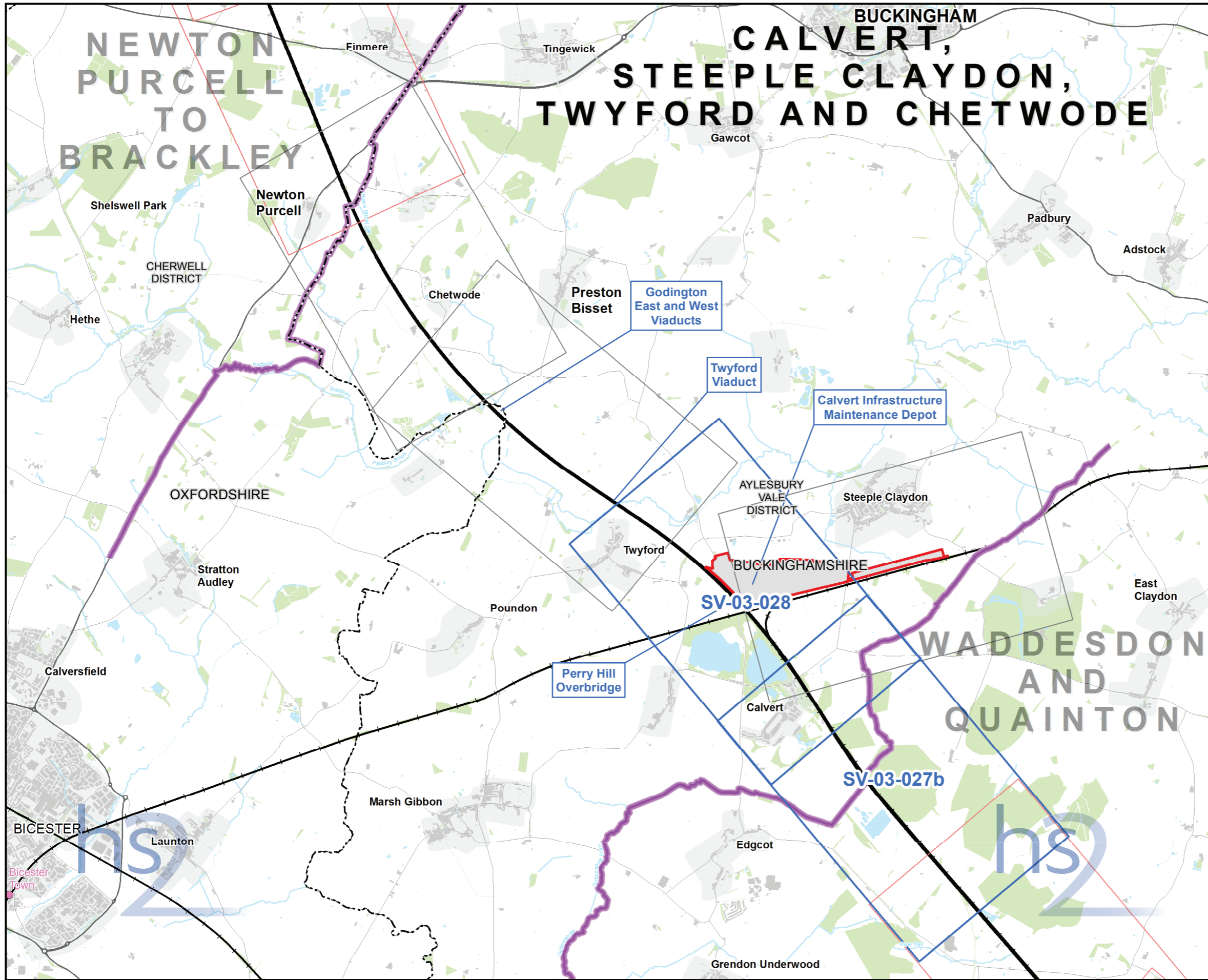
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Date: 21/09/15

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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Community forum boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community forum with amendment
	Map sheets included in this community forum with no amendment
	Map sheets not included in this community forum

Map Number	SV-03-INDEX-CFA13
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES
Community Forum Area CFA13: Calvert, Steeple Claydon, Twyford and Chetwode	

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0 500 1,000 1,500 2,000 Metres

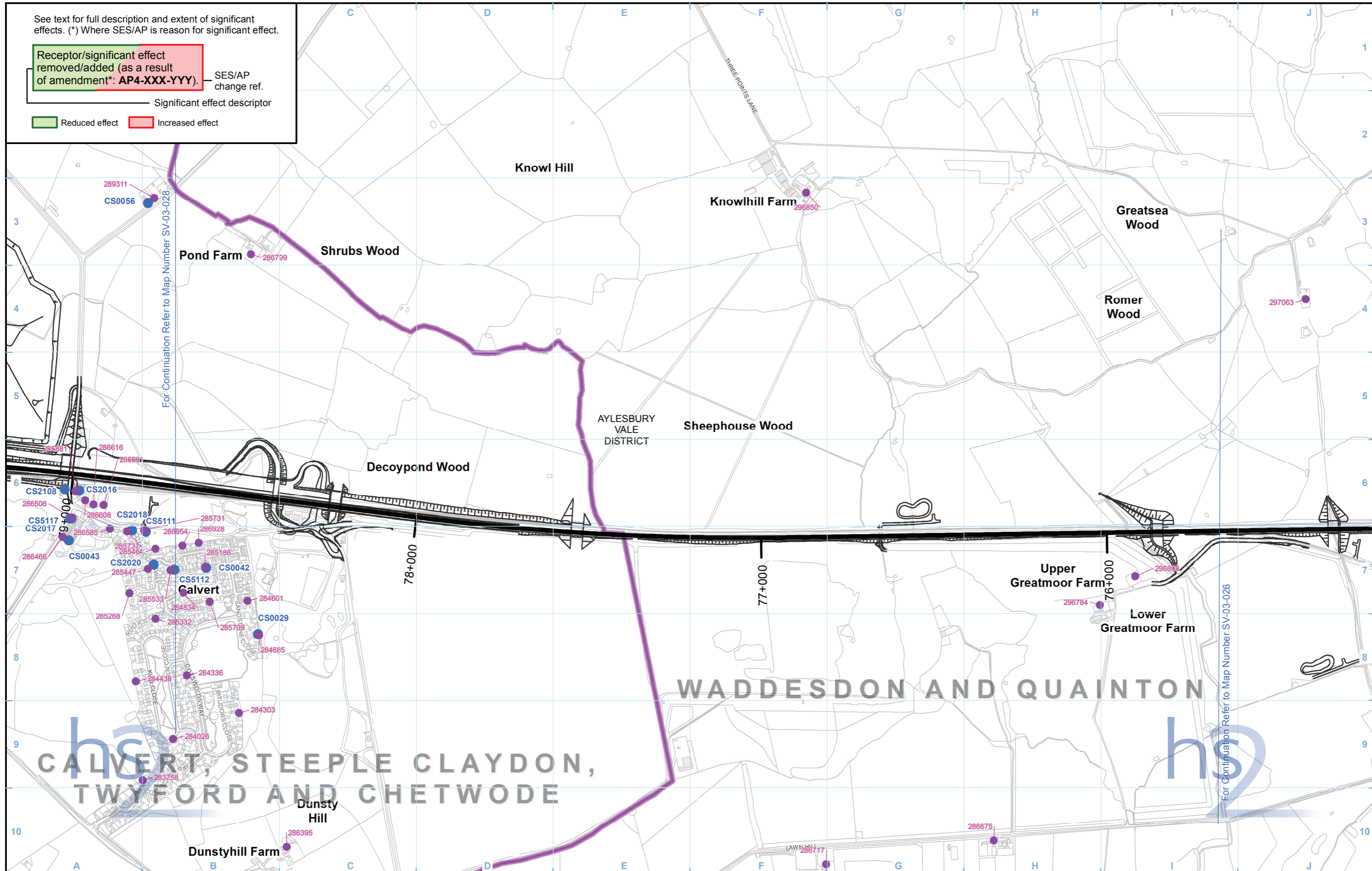
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Note: Not all data layers in the legend are represented on every map.

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). - SES/AP change ref.
Significant effect descriptor
Reduced effect Increased effect



For Continuation Refer to Map Number SV-03-028

For Continuation Refer to Map Number SV-03-026

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV003)

(labelled with Measurement Location reference code)

Map Number SV-03-027b

Map Name Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES

Community Forum Area CFA13:
Calvert, Steeple Claydon, Twyford and Chetwode

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Date: 21/09/15

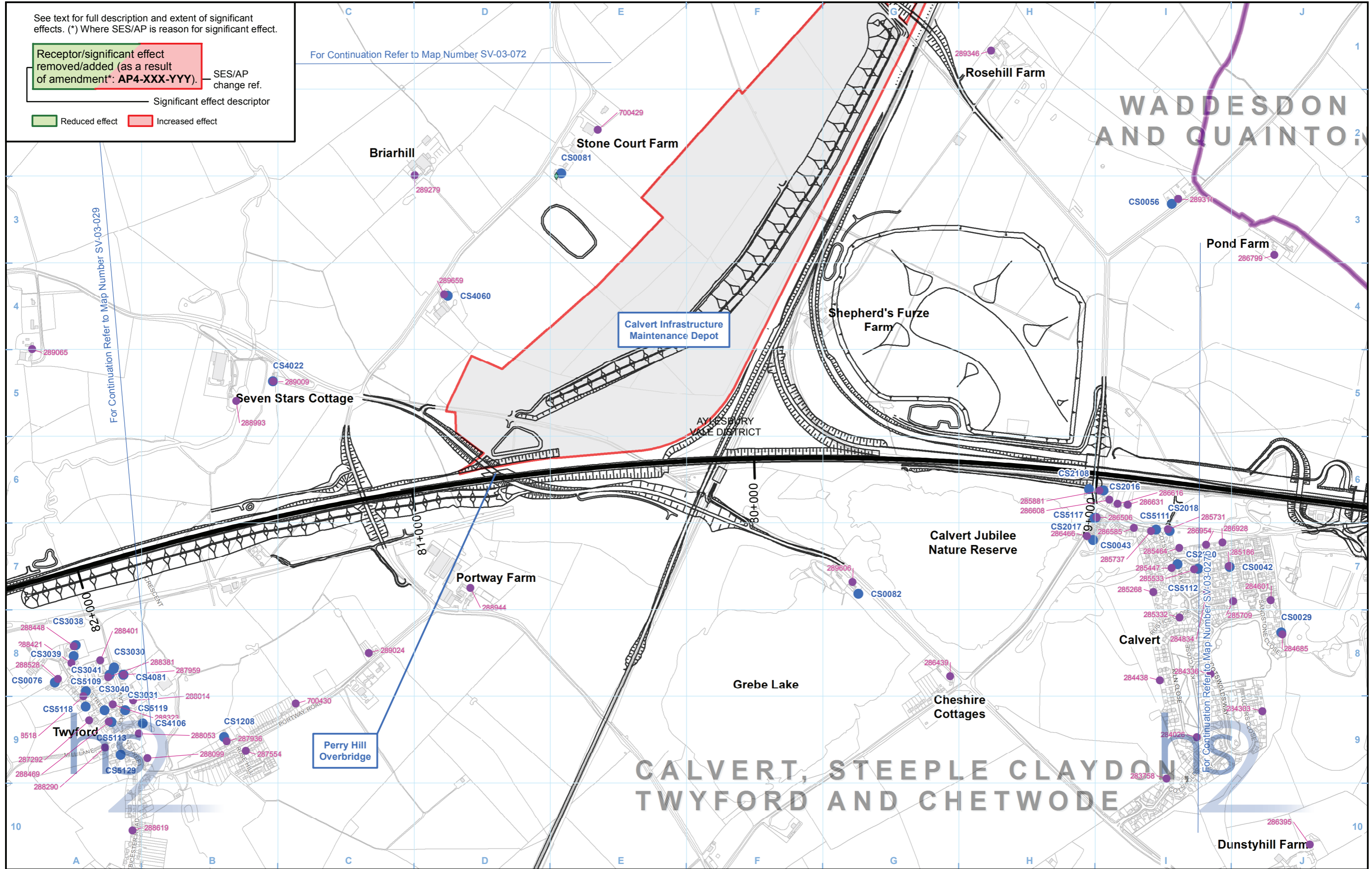
See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect

For Continuation Refer to Map Number SV-03-072



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

- Engineering earthworks:
 - Embankment
 - Cutting
- Non engineering earthworks:
 - Embankment
 - Cutting
- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV003)

labelled with Measurement Location reference code

Map Number SV-03-028

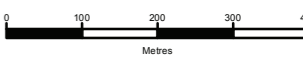
Map Name
Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)
SES3 and AP4 ES

Community Forum Area CFA13:
Calvert, Steeple Claydon, Twyford and Chetwode



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HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

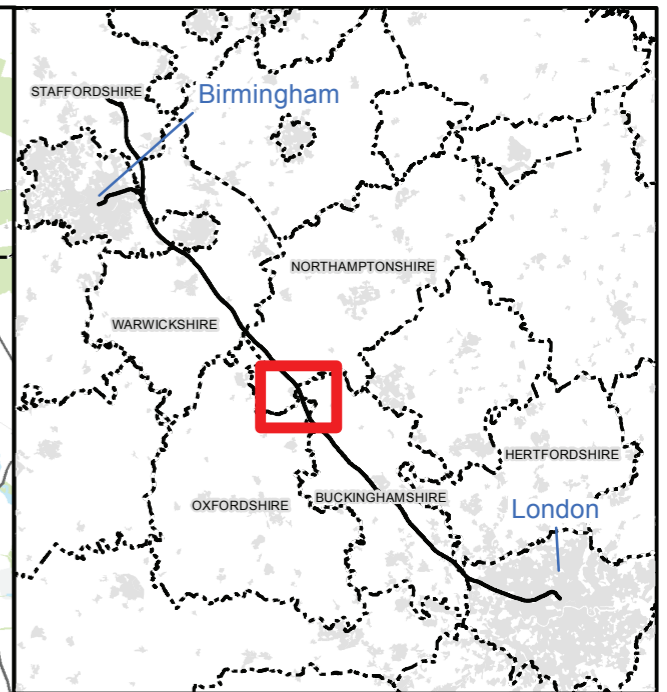
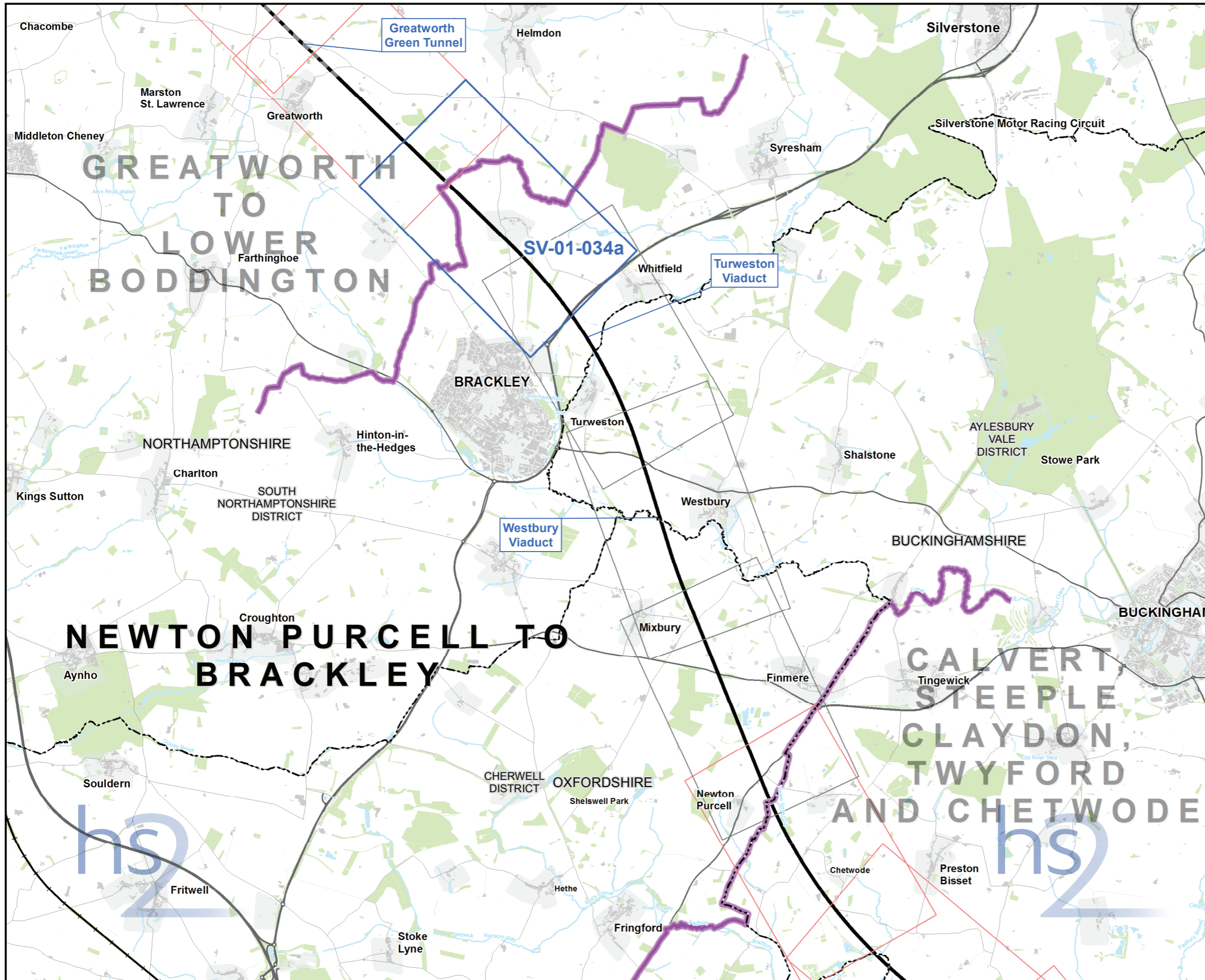
Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 5 | CFA14 Newton Purcell to Brackley

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

October 2015



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-01-INDEX-CFA14
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES3 and AP4 ES
Community Forum Area CFA14: Newton Purcell to Brackley	

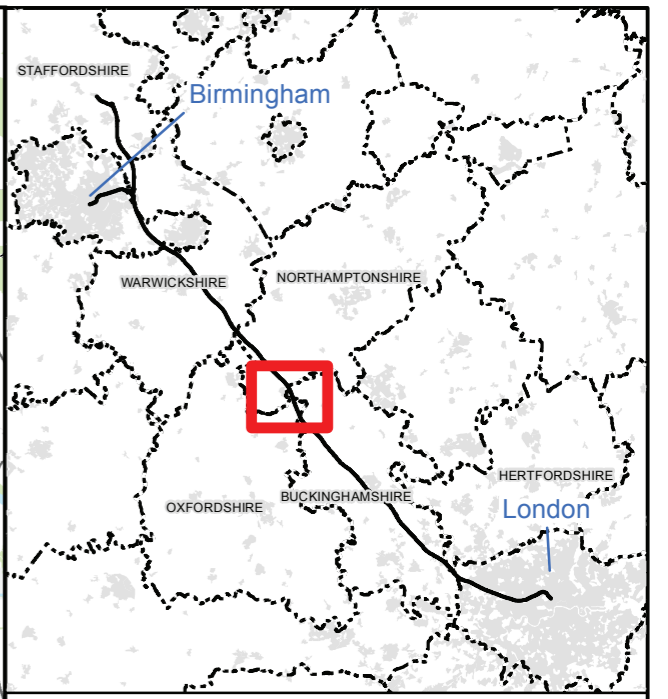
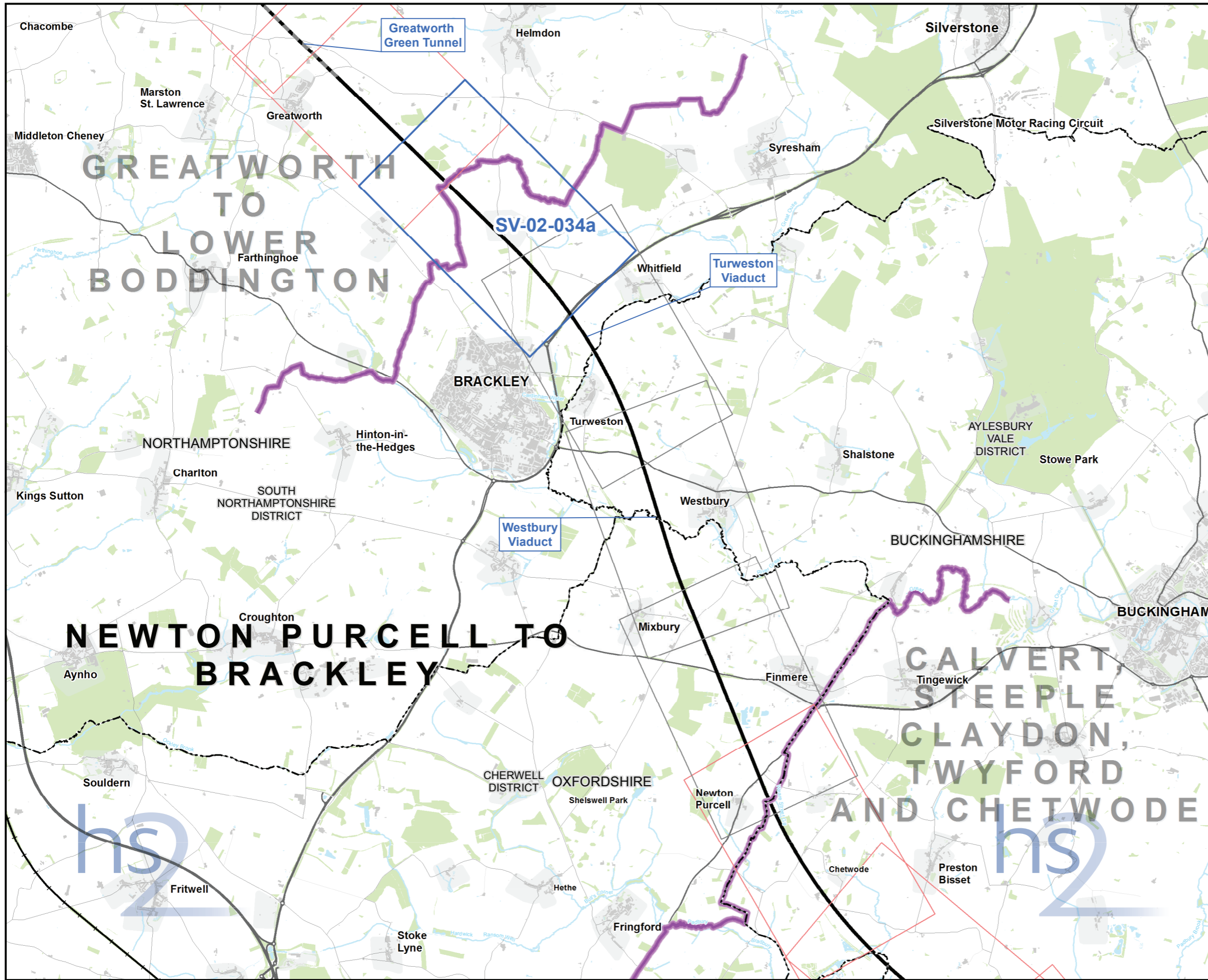
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Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:
 • The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);

• blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;

• the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;

• the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;

• sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series);

• the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and

• labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

	Route in tunnel		Map sheets included in this community forum with amendment
	Route on surface		Map sheets included in this community forum with no amendment
	Depot, station, headhouse or portal building		Map sheets not included in this community forum
	Community forum boundary		
	Existing railway station		
	County boundary		
	District/Borough boundary		

Map Number	SV-02-INDEX-CFA14
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant effects (with Assessment Locations) SES3 and AP4 ES
Community Forum Area CFA14: Newton Purcell to Brackley	

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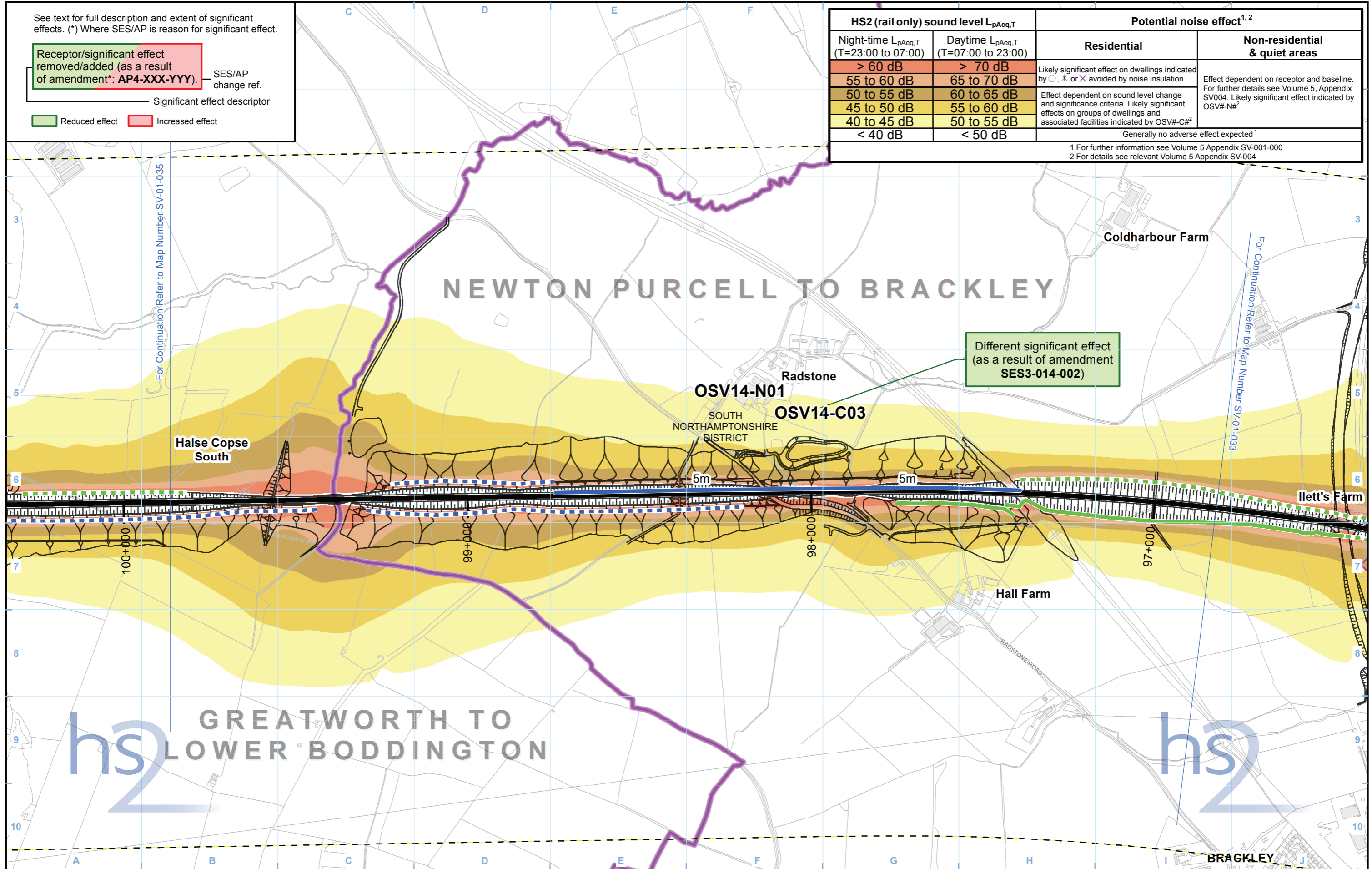
Doc Number: C250-ARP-EV-MAP-000-002082-AP04-P01 Date: 14/09/15

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.
 Significant effect descriptor
 Reduced effect Increased effect

HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or ✕ avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
 2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-034a

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA14: Newton Purcell to Brackley

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Doc Number: C250-ARP-EV-MAP-000-002202-AP04-P01

Date: 17/09/15

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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY).

SES/AP change ref.

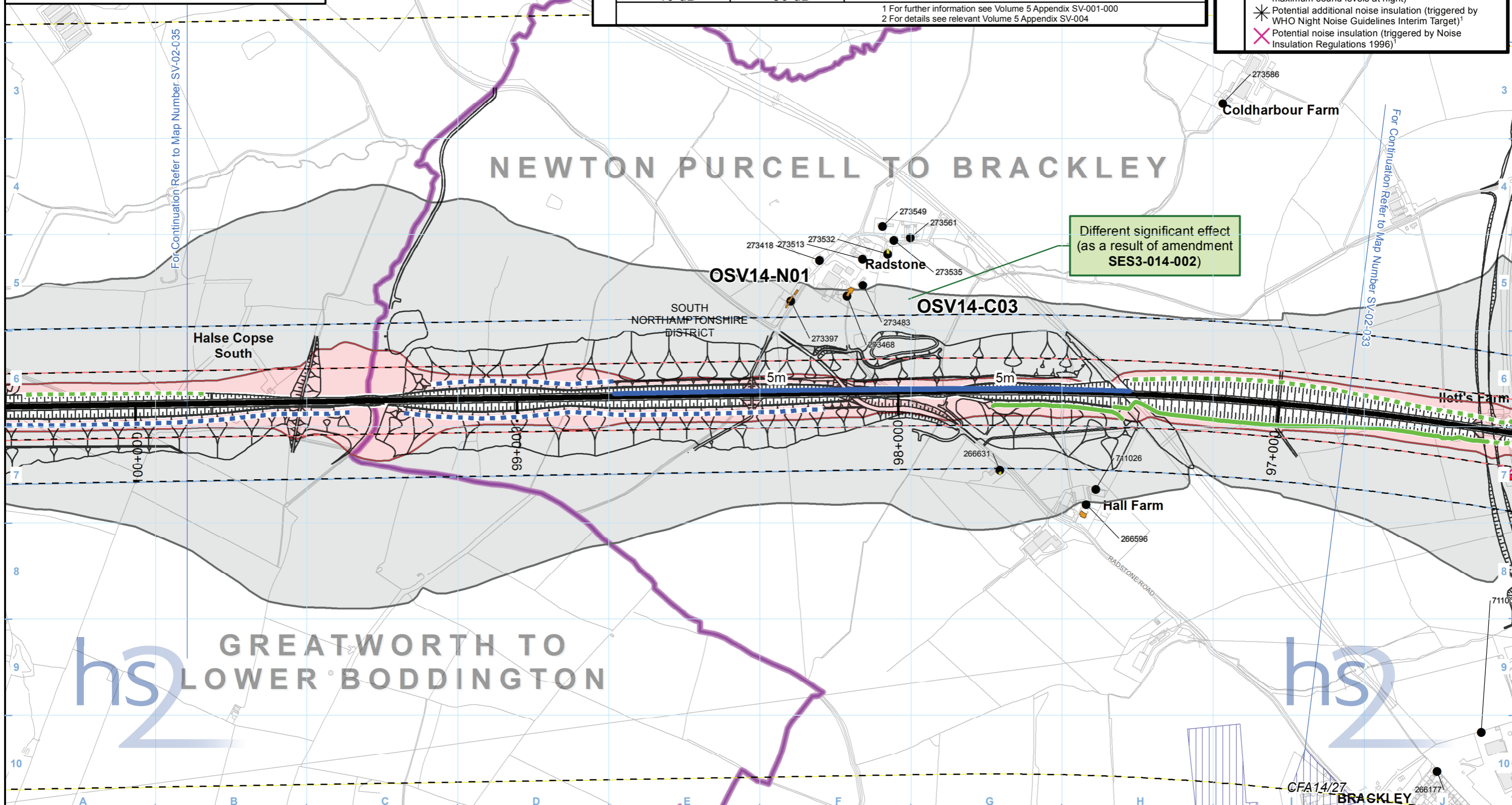
Significant effect descriptor

Reduced effect Increased effect

Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²		
< 40 dB	< 50 dB	Generally no adverse effect expected ¹		

1 For further information see Volume 5 Appendix SV-001-000
2 For details see relevant Volume 5 Appendix SV-004

Panel B	Operational airborne sound impacts at buildings* Change in sound level ($L_{pAeq,T}$ day / night)	
	Major adverse (>10dB)	Moderate adverse (5dB to 10dB)
	Minor adverse (3dB to 5dB)	Negligible (-3dB to 3dB)
Beneficial (<-3dB)		
○ Potential additional noise insulation (triggered by maximum sound levels at night) ¹		
* Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target) ¹		
X Potential noise insulation (triggered by Noise Insulation Regulations 1996) ¹		



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:	Non engineering earthworks:
Embankment	Embankment
Cutting	Cutting

* Residential buildings only
* Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area

Legend - Sound related features

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-034a

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES

Community Forum Area CFA14: Newton Purcell to Brackley

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Date: 21/09/15

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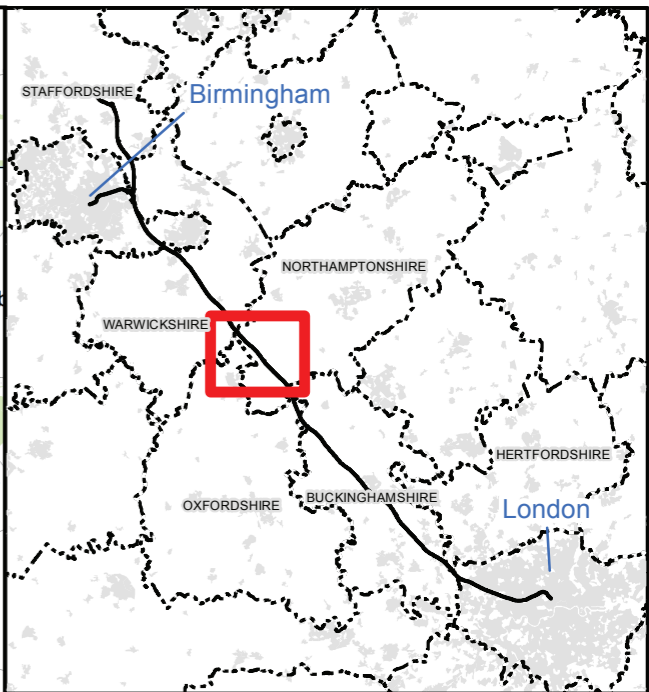
Supplementary Environmental Statement 3 and Additional Provision 4 Environmental Statement

Volume 5 | CFA15 Greatworth to Lower Boddington

SV-01 - Operational Sound Contour Maps and Likely Significant Effects

SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations)

October 2015



Map Series Information:

SV-01 presents the predicted operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{pAeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; the left-hand section of this panel contains a key communicating the night-time and daytime sound levels represented by the various colours. The right-hand part of the same panel contains text explaining how the sound levels presented on the figure inform the assessment of direct noise impacts and likely significant effects. A corresponding and similar panel is found on SV-02, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-01 are the following (which are also included on SV-02):

- A representation of the Proposed Scheme, including the railway alignment (indicating whether it is on the surface or in tunnel), any new and altered roads and all associated engineering and environmental mitigation earthworks;
- blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;
- symbols representing buildings that would potentially qualify for noise insulation;
- labels identifying the residual likely significant noise effects of the Proposed Scheme, and
- the extent of the study area within which the direct impacts and effects of the scheme have been quantitatively assessed.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend

	Route in tunnel		Map sheets included in this community forum with amendment
	Route on surface		Map sheets included in this community forum with no amendment
	Depot, station, headhouse or portal building		Map sheets not included in this community forum
	Community forum boundary		
	Existing railway station		
	County boundary		
	District/Borough boundary		

Map Number	SV-01-INDEX-CFA15
Map Name	Index Map of: Operational Sound Contour Maps and Likely Significant Effects SES3 and AP4 ES
Community Forum Area CFA15: Greatworth to Lower Boddington	

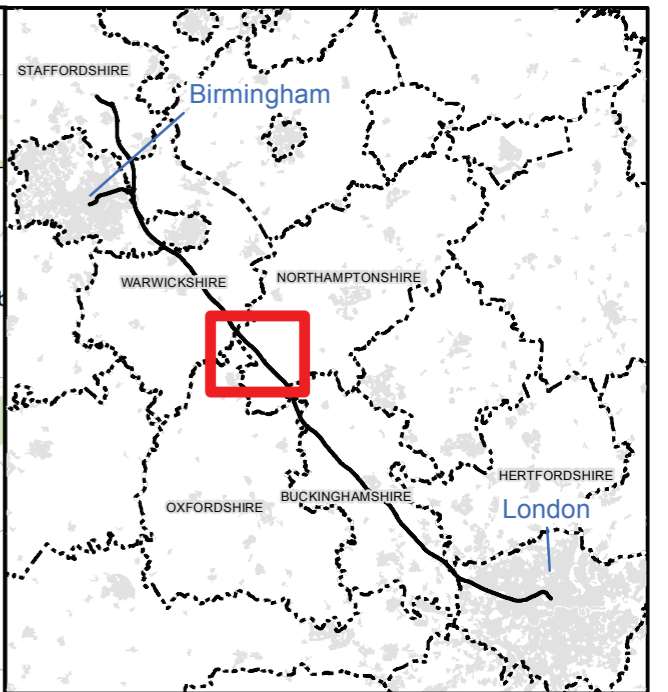
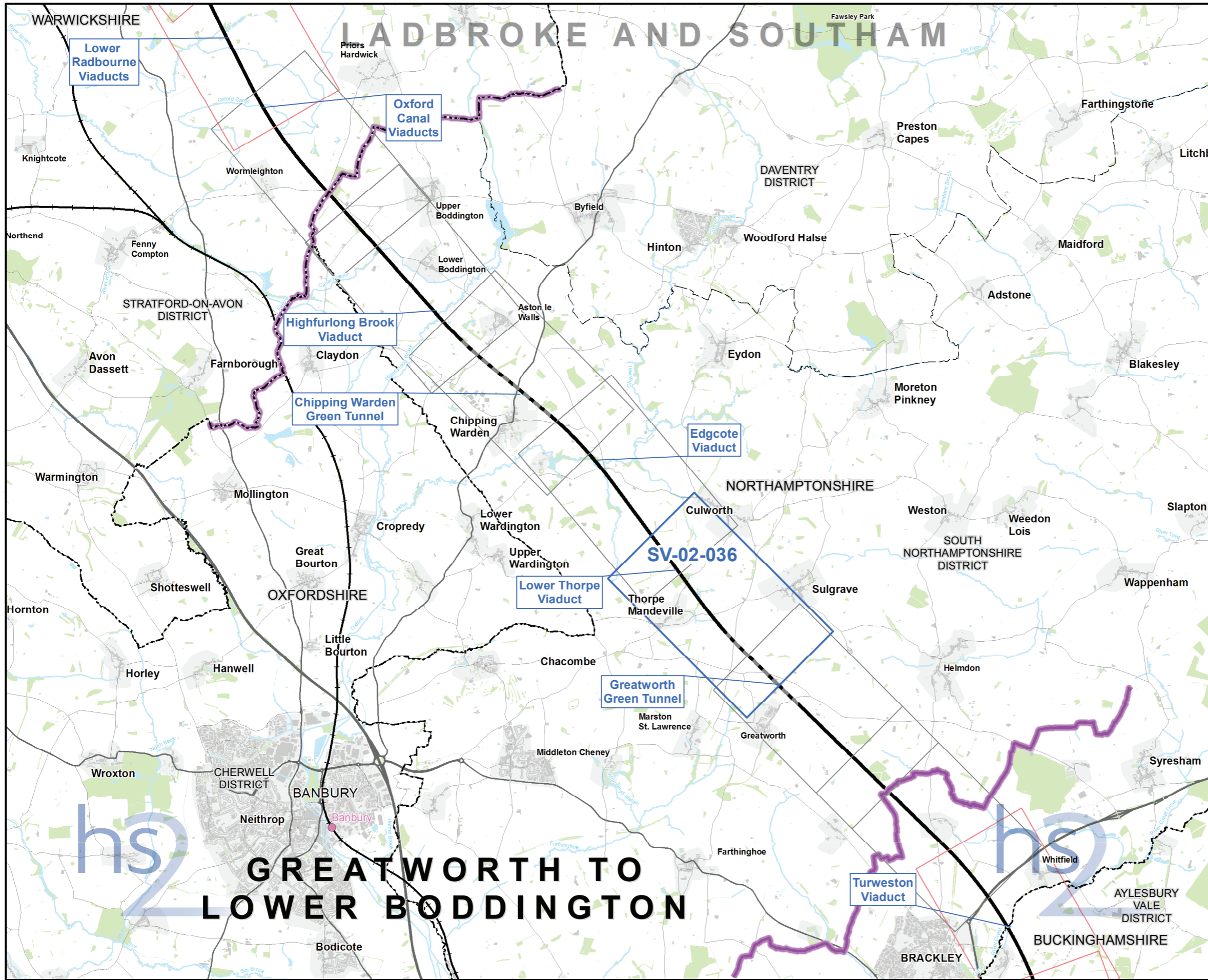
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Doc Number: C250-ARP-EV-MAP-000-002059-AP04-P01 Date: 14/09/15



Map Series Information:

SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.

The SV-02 figure series necessarily contains a large amount of information relating to the operational noise and vibration assessment. It is designed to communicate visually the assessment process from the prediction of impacts to the determination of likely residual significant effects. The corresponding text is included in Vol2 and Vol5.

Key items on the map include the following:
 • The Proposed Scheme (the proposed railway alignments and surrounding associated earthworks/roads);

• blue and green lines representing the wayside airborne noise mitigation measures included in the Proposed Scheme;

• the study areas, which indicate the areas within which direct sound and vibration impacts of the scheme have been quantitatively assessed;

• the calculated direct operational impacts of the scheme, displayed as colour-coded buildings and symbols representing buildings that would potentially qualify for noise insulation;

• sound contours representing sound produced by the new railway displayed in a simpler manner than on SV-01 in order not to obscure the features on the map series);

• the assessment locations at which a quantitative prediction of sound and impacts have been carried out (representing a number of nearby buildings). These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004; and

• labels indicating where the likely residual direct noise or vibration significant effects have been identified. These are labelled with a unique reference number to enable cross-reference to further detail regarding the assessments in Volume 5: Appendix SV-004.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

- Main Map Legend**
- Route in tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community forum boundary
 - Existing railway station
 - County boundary
 - District/Borough boundary
 - Map sheets included in this community forum with amendment
 - Map sheets included in this community forum with no amendment
 - Map sheets not included in this community forum

Map Number	SV-02-INDEX-CFA15
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant effects (with Assessment Locations) SES3 and AP4 ES
Community Forum Area CFA15: Greatworth to Lower Boddington	

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0 800 1,600 2,400 3,200 Metres

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Scale at A3: 1:80,000

0 800 1,600 2,400 3,200 Metres

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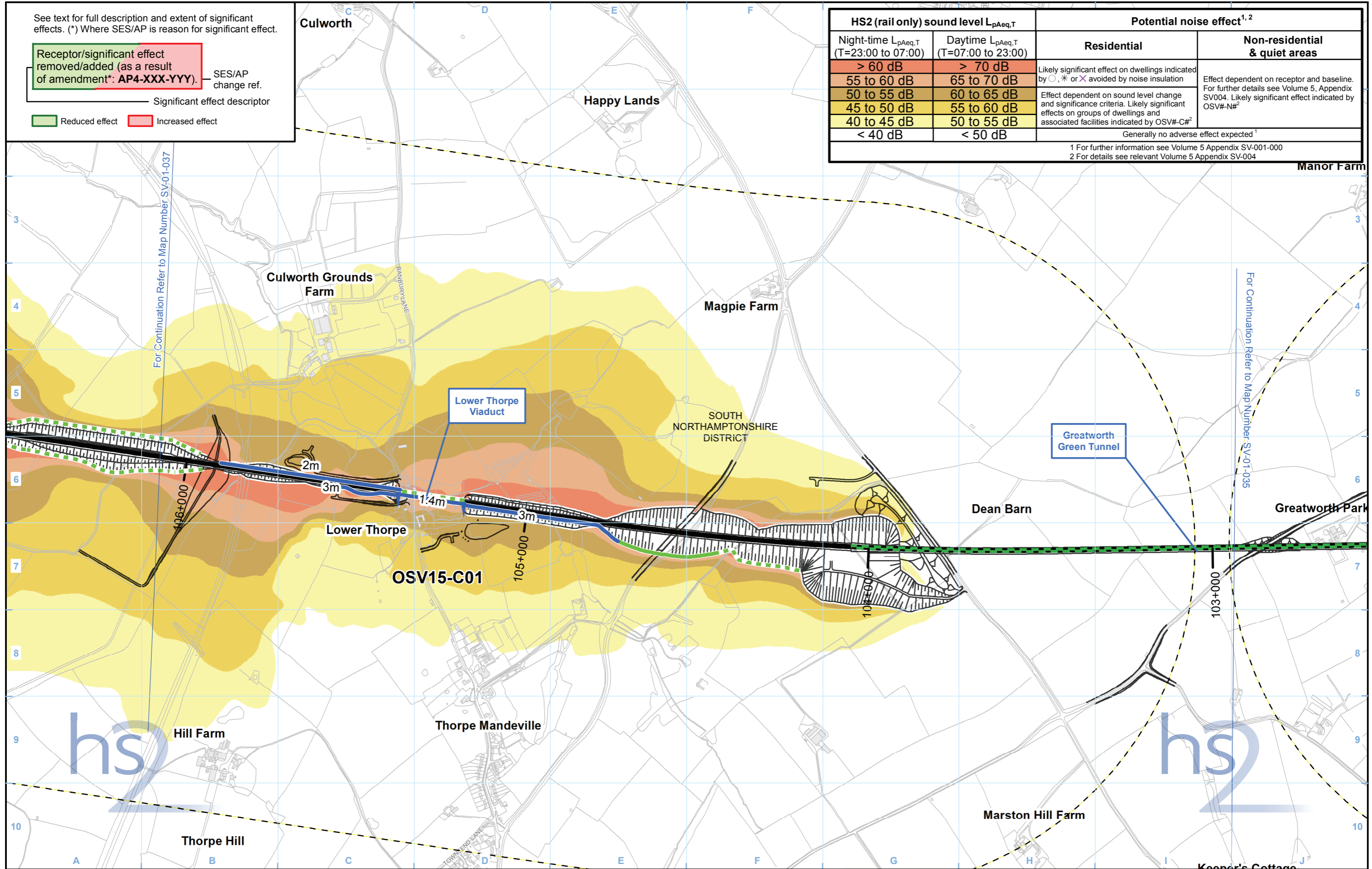
Doc Number: C250-ARP-EV-MAP-000-002083-AP04-P01 Date: 14/09/15

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.
 Significant effect descriptor
 Reduced effect Increased effect

HS2 (rail only) sound level L _{pAeq,T}		Potential noise effect ^{1,2}	
Night-time L _{pAeq,T} (T=23:00 to 07:00)	Daytime L _{pAeq,T} (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
> 60 dB	> 70 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
55 to 60 dB	65 to 70 dB	Effect dependent on sound level change and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
50 to 55 dB	60 to 65 dB		
45 to 50 dB	55 to 60 dB		
40 to 45 dB	50 to 55 dB		
< 40 dB	< 50 dB		

1 For further information see Volume 5 Appendix SV-001-000
 2 For details see relevant Volume 5 Appendix SV-004



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers*
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged measures further reducing noise effects:

- Other environmental e.g. landscaping
- Engineering e.g. cuttings

- Airborne sound study area
- Potential additional noise insulation (triggered by maximum sound levels at night)¹
- Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
- Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹

* Labelled with total barrier height above rail level

Map Number: SV-01-036

Map Name: Operational Sound Contour maps and Likely Significant Effects SES3 and AP4 ES

Community Forum Area CFA15: Greatworth to Lower Boddington

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Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). SES/AP change ref. Significant effect descriptor
 Reduced effect Increased effect

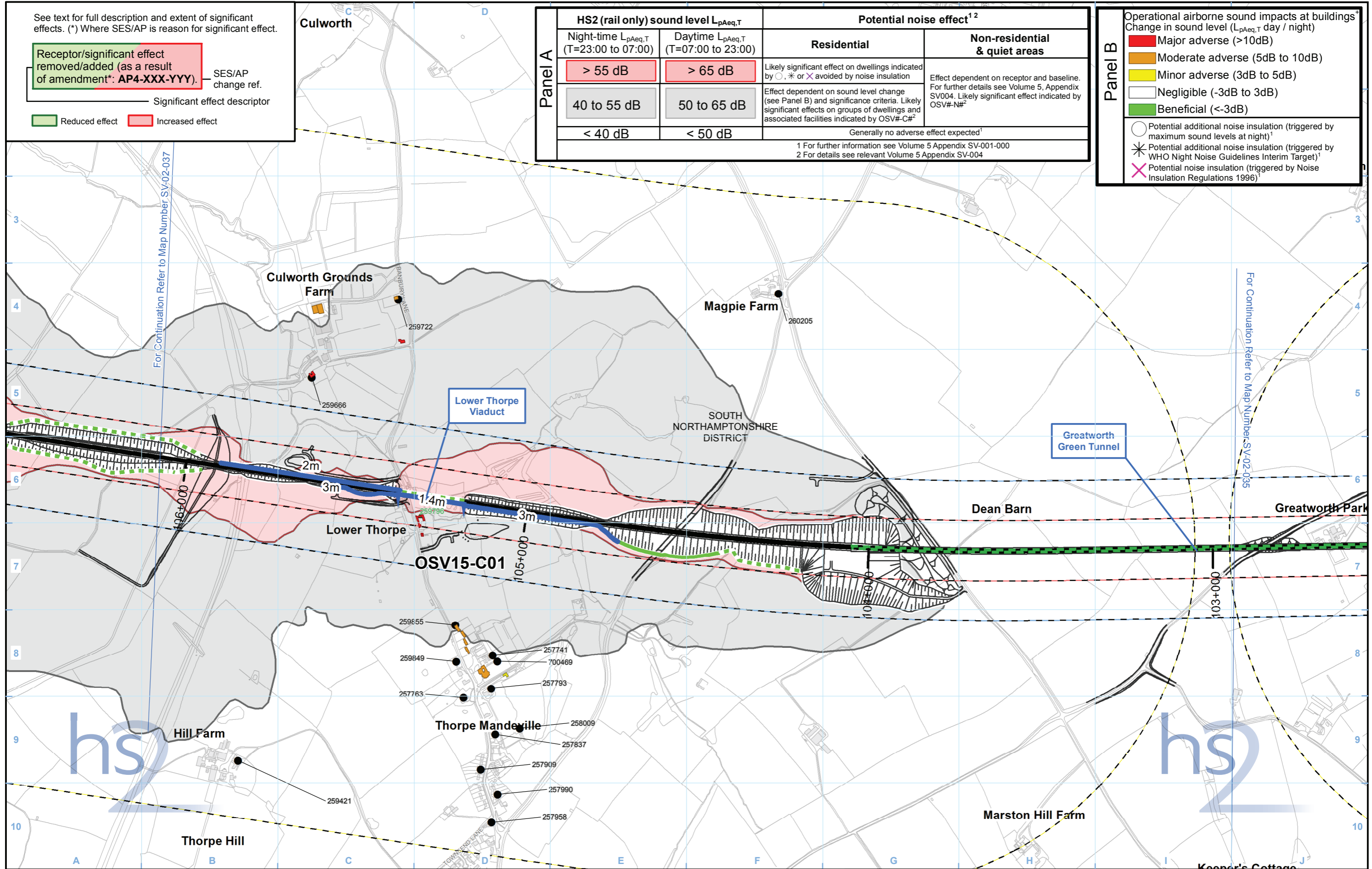
Panel A	HS2 (rail only) sound level $L_{pAeq,T}$		Potential noise effect ^{1,2}	
	Night-time $L_{pAeq,T}$ (T=23:00 to 07:00)	Daytime $L_{pAeq,T}$ (T=07:00 to 23:00)	Residential	Non-residential & quiet areas
	> 55 dB	> 65 dB	Likely significant effect on dwellings indicated by ○, * or X avoided by noise insulation	Effect dependent on receptor and baseline. For further details see Volume 5, Appendix SV004. Likely significant effect indicated by OSV#-N# ²
	40 to 55 dB	50 to 65 dB	Effect dependent on sound level change (see Panel B) and significance criteria. Likely significant effects on groups of dwellings and associated facilities indicated by OSV#-C# ²	Generally no adverse effect expected ¹
< 40 dB	< 50 dB			

1 For further information see Volume 5 Appendix SV-001-000
 2 For details see relevant Volume 5 Appendix SV-004

Operational airborne sound impacts at buildings*
 Change in sound level ($L_{pAeq,T}$ day / night)

Major adverse (>10dB)
Moderate adverse (5dB to 10dB)
Minor adverse (3dB to 5dB)
Negligible (-3dB to 3dB)
Beneficial (<-3dB)

Potential additional noise insulation (triggered by maximum sound levels at night)¹
 Potential additional noise insulation (triggered by WHO Night Noise Guidelines Interim Target)¹
 Potential noise insulation (triggered by Noise Insulation Regulations 1996)¹



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Embankment
- Cutting

* Residential buildings only
 * Labelled with total barrier height above rail level

Legend - Sound related features

- Committed developments (label as CFA#/#) - SV Only
- Envisaged mitigation to avoid / reduce significant noise effects:
 - Landscaping and/or fence barriers*
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged measures further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne sound study area

- Ground-borne sound & vibration study area (residential and non-residential)
- Ground-borne sound & vibration study area (highly sensitive non-residential)
- Airborne sound assessment location
- Airborne sound and vibration assessment location
- Ground-borne sound and/or vibration assessment location
- Airborne sound, ground-borne sound and vibration assessment location
- Minor ground-borne noise or vibration impact*

Map Number: SV-02-036

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects (with Assessment Locations) SES3 and AP4 ES

Community Forum Area CFA15: Greatworth to Lower Boddington

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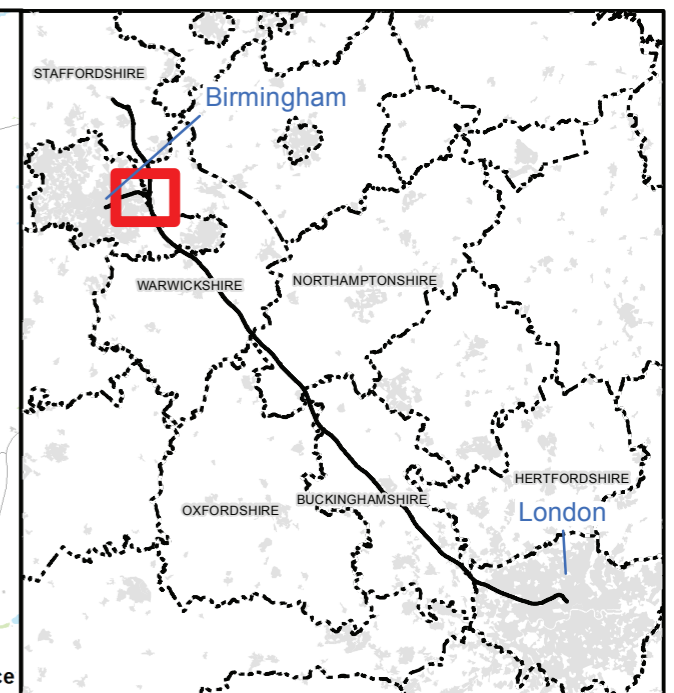
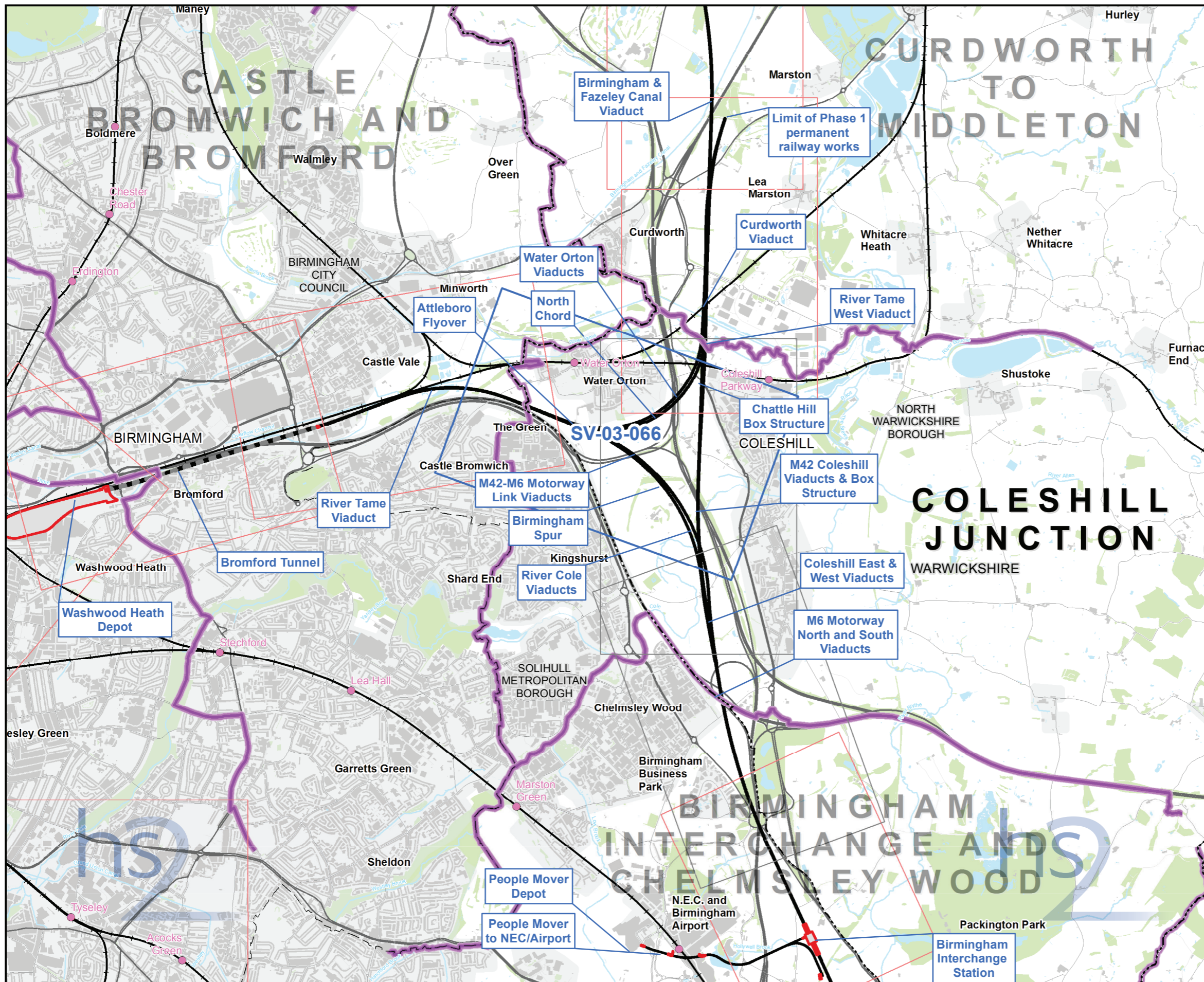
Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

Volume 5 | CFA19 Coleshill Junction

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

October 2015

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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Note: Not all data layers in the legend are represented on every map.

Main Map Legend	
	Route in tunnel
	Route on surface
	Depot, station, headhouse or portal building
	Community forum boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community forum with amendment
	Map sheets included in this community forum with no amendment
	Map sheets not included in this community forum

Map Number	SV-03-INDEX-CFA19
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES
Community Forum Area CFA19: Coleshill Junction	

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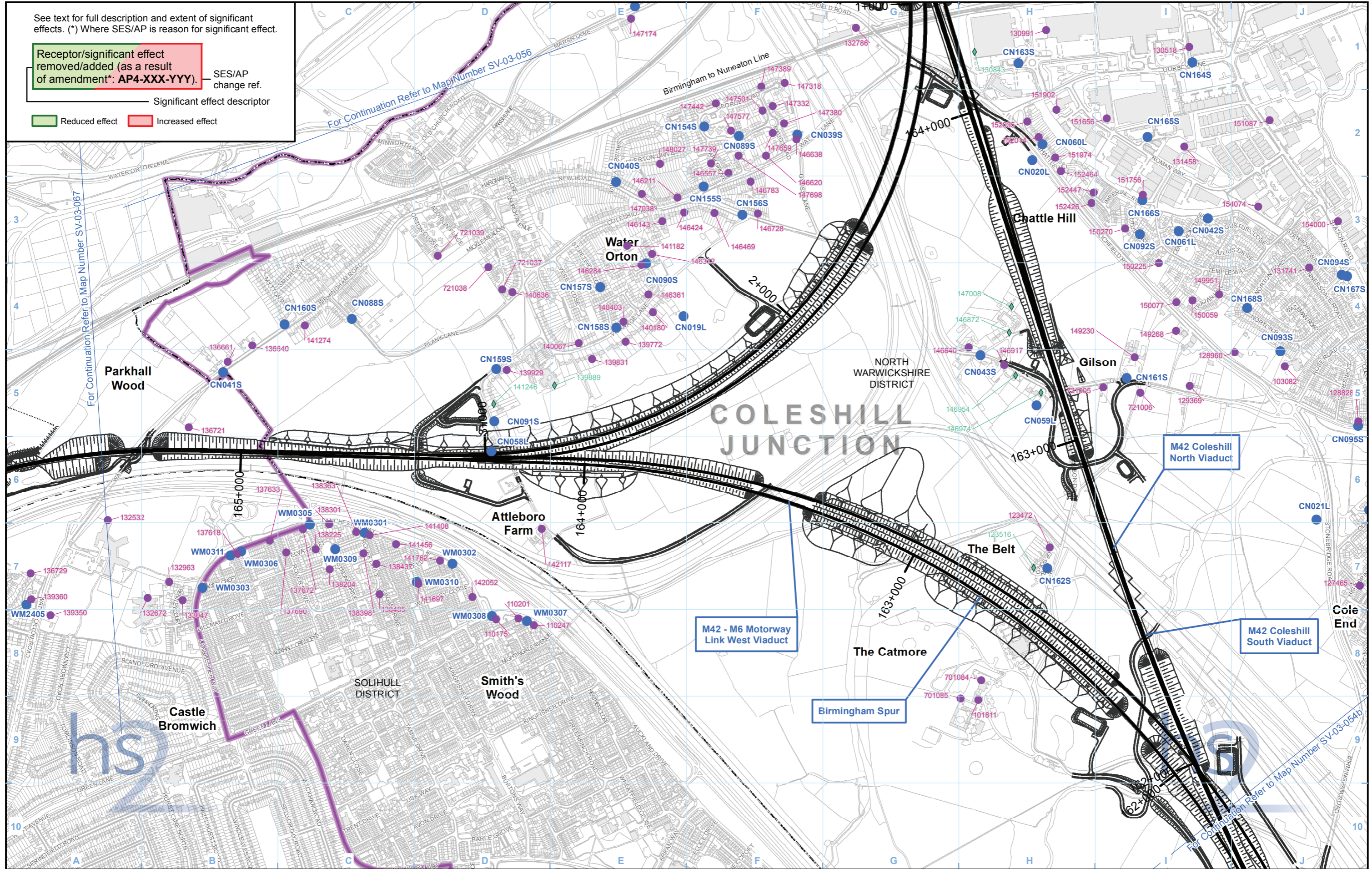
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See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

Significant effect descriptor

Reduced effect Increased effect



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:	Non engineering earthworks:
Embankment	Embankment
Cutting	Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV003)

(labelled with Measurement Location reference code)

Map Number: SV-03-066

Map Name: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA19: Coleshill Junction

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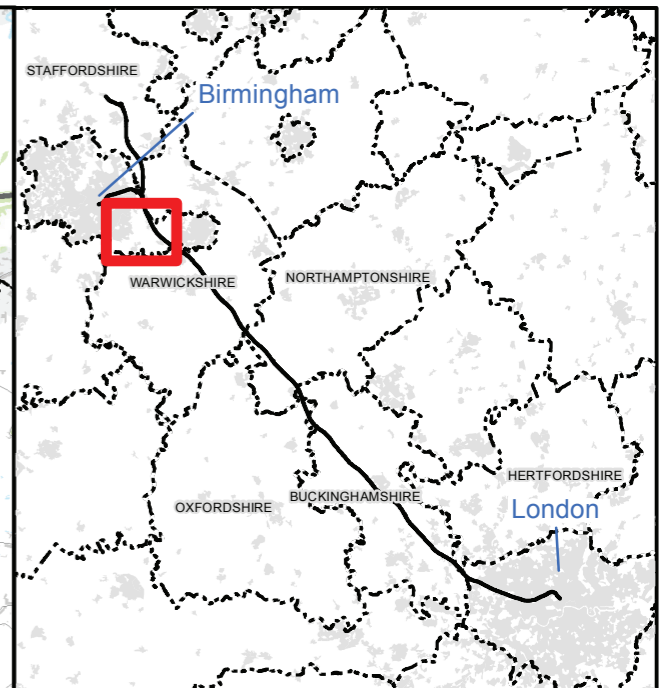
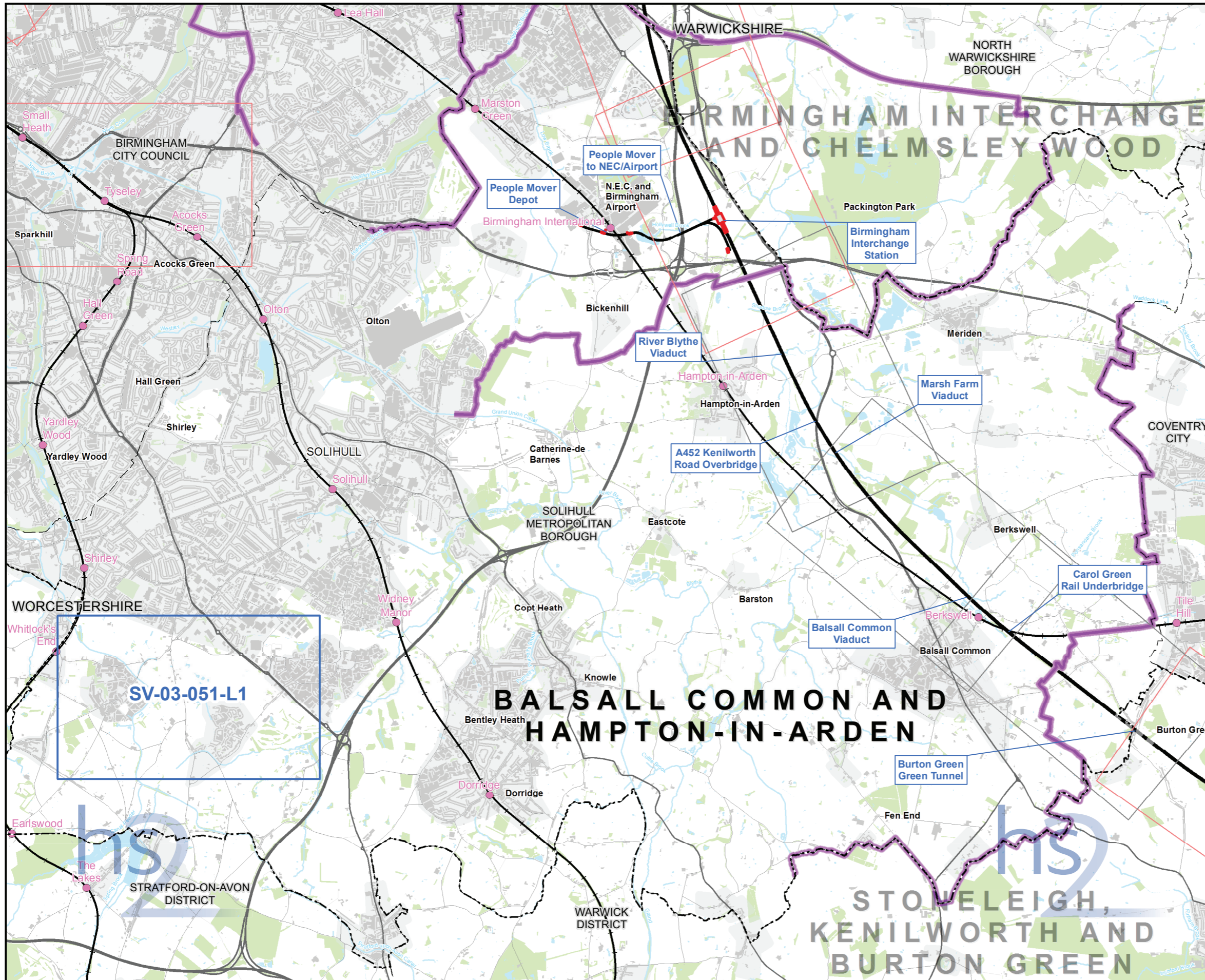
Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

Volume 5 | CFA23 Balsall Common and Hampton-in-Arden

SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

October 2015

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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend

Route in tunnel	Map sheets included in this community forum with amendment
Route on surface	Map sheets included in this community forum with no amendment
Depot, station, headhouse or portal building	Map sheets not included in this community forum
Community forum boundary	
Existing railway station	
County boundary	
District/Borough boundary	

Map Number	SV-03-INDEX-CFA23
Map Name	Index Map of: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES
	Community Forum Area CFA23: Balsall Common and Hampton-in-Arden

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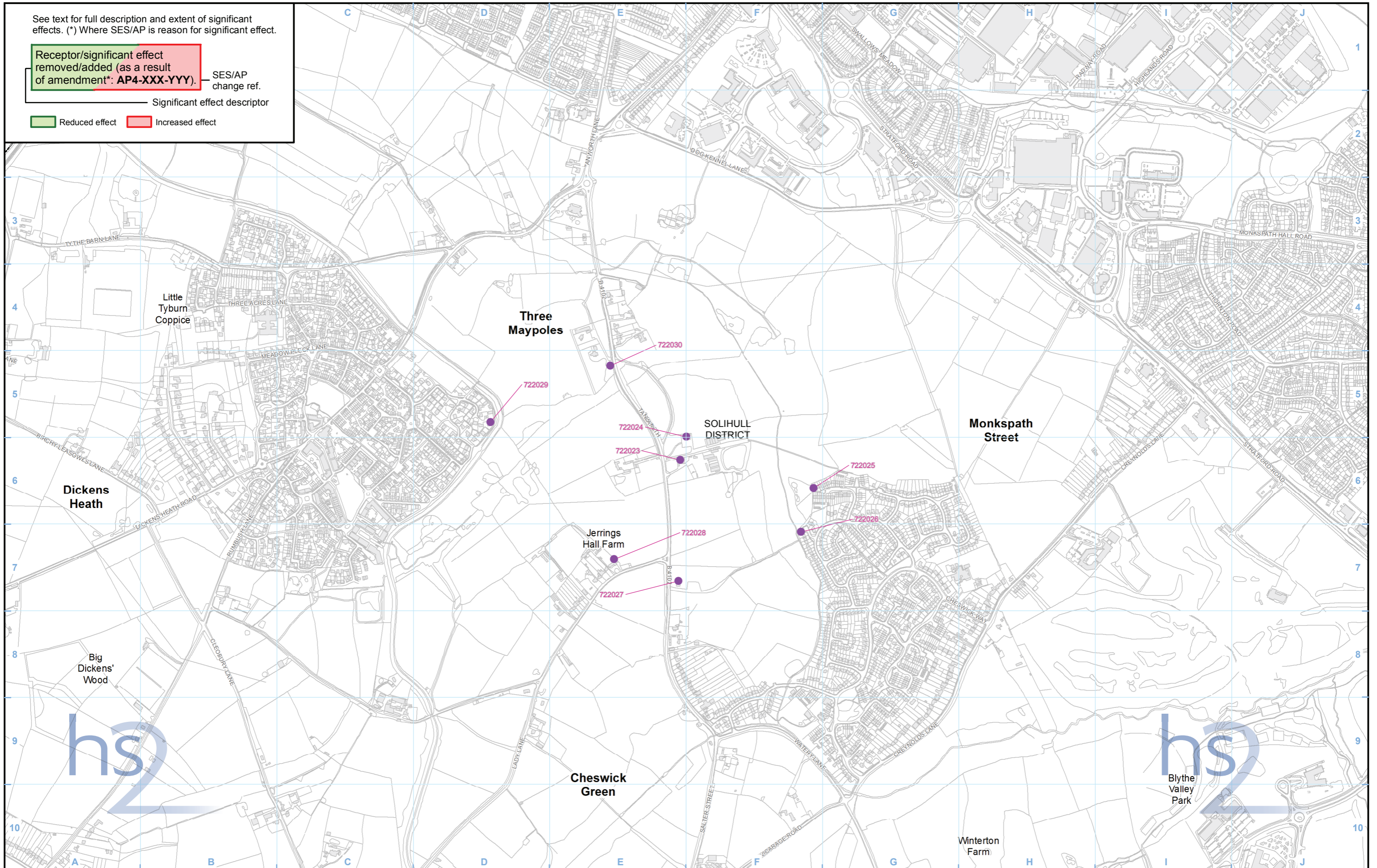
Doc Number: C250-ARP-EV-MAP-000-002111-AP04-P01 **Date: 14/09/15**

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

— Significant effect descriptor

Reduced effect Increased effect



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Embankment
- Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV003)

(labelled with Measurement Location reference code)

Map Number SV-03-051-L1

Map Name Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA23: Balsall Common and Hampton in Arden

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Doc Number: C250-ARP-EV-MAP-000-002401-AP04-P01 Date: 21/09/15

HIGH SPEED RAIL (LONDON - WEST MIDLANDS)

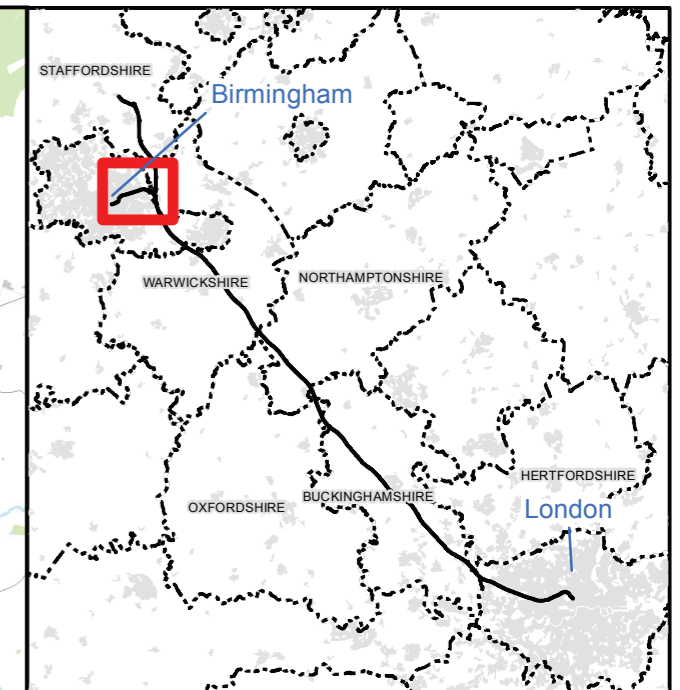
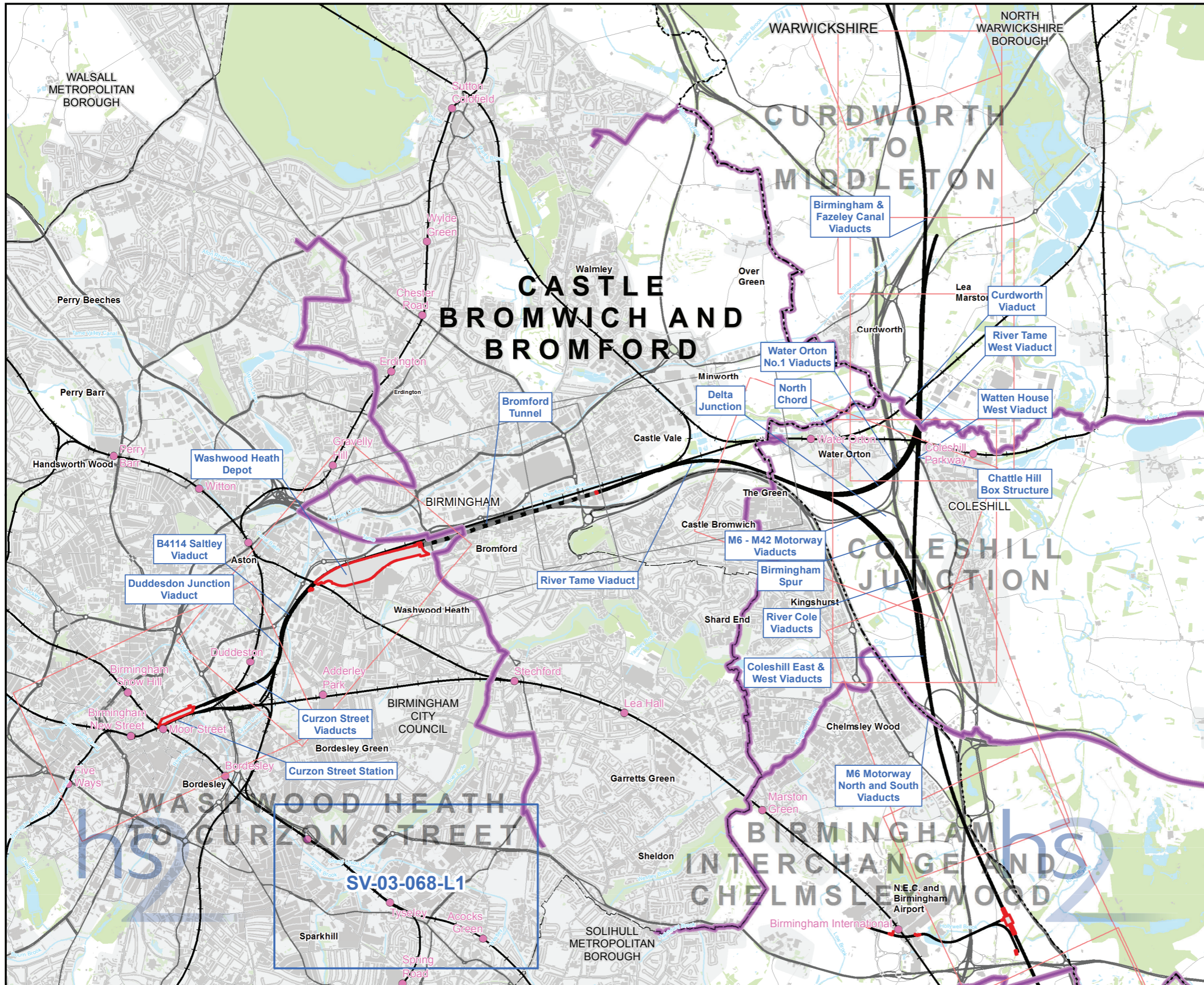
Supplementary Environmental Statement 3 and
Additional Provision 4 Environmental Statement

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SV-03 - Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments

October 2015

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Map Series Information:

The SV-03 figure series accompanies the construction noise & vibration assessments. It shows the locations at which a quantitative assessment of the direct effects of construction noise and/or vibration has been carried out. These are labelled as assessment locations with a reference number to enable cross-reference to the construction noise and vibration reports contained in Volume 5: Appendix SV-003 and Volume 5: Appendix SV-002.

The figure series also shows locations at which baseline sound measurements were carried out. These baseline measurement locations are labelled with a reference number to enable cross-reference to the baseline sound reports contained in Volume 5: Appendix SV-002.

A more detailed explanation of each legend item included on the figures can be found in the data dictionary.

Main Map Legend

- Route in tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community forum with amendment
- Map sheets included in this community forum with no amendment
- Map sheets not included in this community forum

Map Number **SV-03-INDEX-CFA25**

Map Name
**Index Map of:
 Assessment and Monitoring Locations for
 Construction Sound, Noise & Vibration Assessments
 SES3 and AP4 ES**

**Community Forum Area CFA25:
 Castle Bromwich and Bromford**

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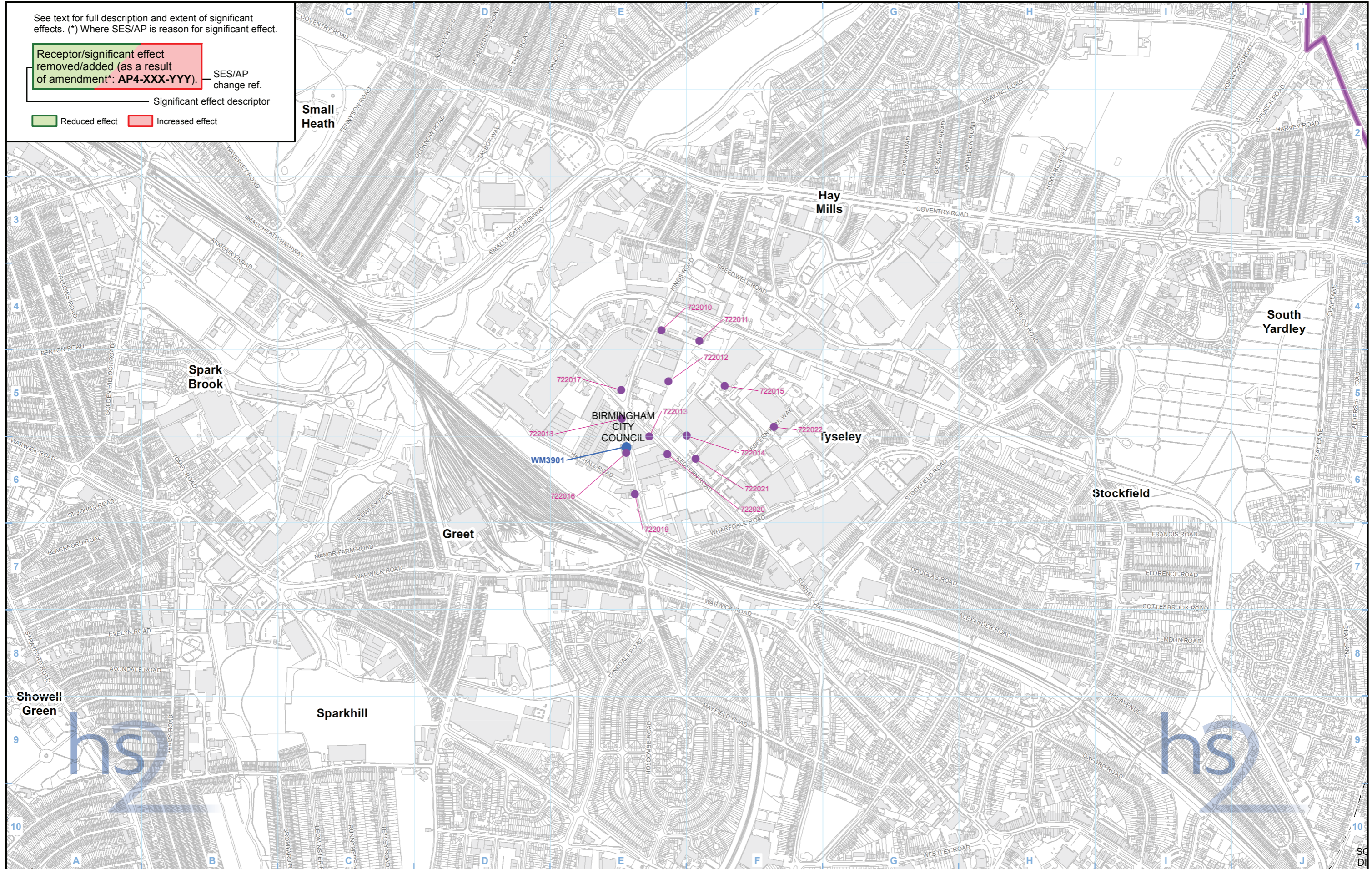
Doc Number: C250-ARP-EV-MAP-000-002114-AP04-P01 **Date: 14/09/15**

See text for full description and extent of significant effects. (*) Where SES/AP is reason for significant effect.

Receptor/significant effect removed/added (as a result of amendment*: AP4-XXX-YYY). — SES/AP change ref.

— Significant effect descriptor

Reduced effect Increased effect



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community forum boundary
- District/Borough boundary
- County boundary

Legend - Sound related features

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Construction airborne sound assessment location
- Construction vibration assessment locations
- Construction airborne sound and vibration assessment location
- Baseline measurement locations

labelled with Assessment Location ID reference number (for details of the assessment results see Vol 5 Appendix SV003)

(labelled with Measurement Location reference code)

Map Number: SV-03-068-L1

Map Name: Assessment and Monitoring Locations for Construction Sound, Noise & Vibration Assessments SES3 and AP4 ES

Community Forum Area CFA25: Castle Bromwich and Bromford

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