

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Volume 5: Map Book

Sound, noise and vibration (SV-02, SV-03, SV-08, SV-09)

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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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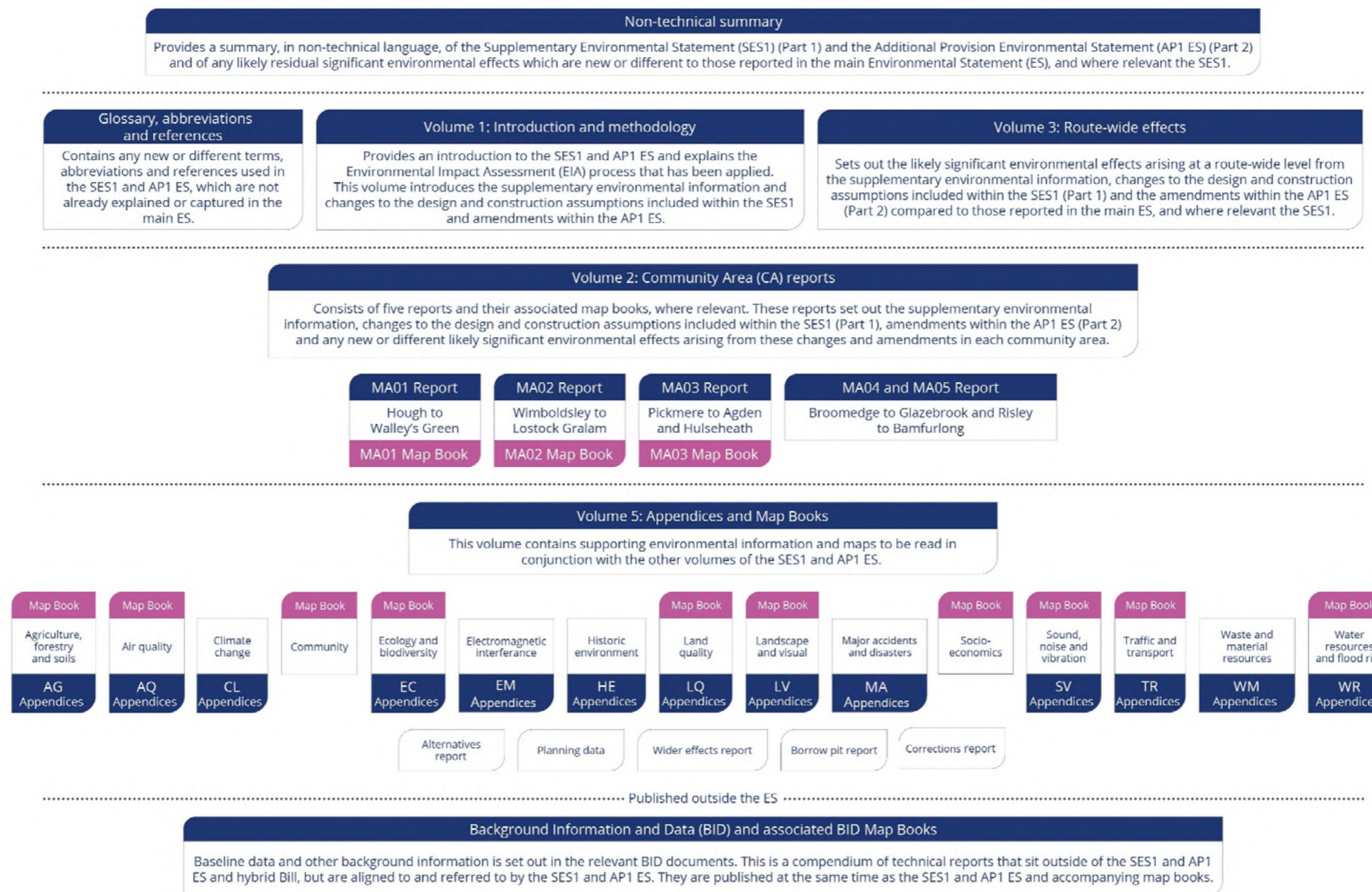
Data dictionary and definitions

Map series name	SV-02 - Operational Airborne Noise and Vibration Impacts and Likely Significant Effects	SV-03 - Construction Airborne Noise and Vibration Likely Significant Effects	SV-08 - Daytime Operational Sound Contour Maps	SV-09 - Night-time Operational Sound Contour Maps
Map series description	<p>SV-02 presents the direct operational noise impacts and likely significant effects of the Proposed Scheme.</p> <p>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.</p> <p>A more detailed explanation of each legend item included on the figures can be found in the data dictionary.</p>	<p>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-002-0XX. A more detailed explanation of each legend item included on the figures can be found in the data dictionary.</p>	<p>SV-08 presents the predicted daytime 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; this panel contains a key communicating the daytime sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-09, along with the key sound contours that were used within the environmental assessment.</p> <p>A more detailed explanation of each legend item included on the figures can be found in the data dictionary.</p>	<p>SV-09 presents the predicted night-time 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; this panel contains a key communicating the night-time sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-08, along with the key sound contours that were used within the environmental assessment.</p> <p>A more detailed explanation of each legend item included on the figures can be found in the data dictionary.</p>
Community Area name				
MA01 Hough to Walley's Green	✓	✓	✓	✓
MA02 Wimboldsley to Lostock Gralam	✓	✓	✓	✓
MA03 Pickmere to Agden and Hulseheath	✓	✓	✓	✓
MA04 Broomedge to Glazebrook				
MA05 Risley to Bamfurlong				

Mapping explanatory notes

Structure of the Supplementary Environmental Statement 1 and the Additional Provision 1 Environmental Statement

This map book is part of the suite of documents that make up the Supplementary Environmental Statement 1 (SES1) and the Additional Provision 1 Environmental Statement (AP1 ES) for the High Speed Rail (Crewe – Manchester) scheme. The SES1 and the AP1 ES are separate documents; however, they are bound together and presented in a number of volumes shown in Figure 1.



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 SES1 and AP1 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 SES1 and AP1 ES have a chainage value shown next to the alignment. Chainage is presented on the maps in black font, in the form of XXX+YYY, e.g. 192+000 or 239+500.

Chainage (known as reference chainage) is referenced from Euston Station, which is 0+000, and the value presented is in metres, e.g. 192+000 refers to the point, 192,000m, or 192km, from Euston Station. Chainage values increase in intervals dependent 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 1:20,000, 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 (In Parliament - Session 2021 - 2022) on the left-hand page and the SES1 and the AP1 ES map on the right. For the CT-05 and CT-06 map series, the SES1 and the AP1 ES is shown with different coloured hatching, annotated with labels, which highlights the areas of change. The coloured text box provides a brief description of the design change and amendment, and gives the SES1 and the AP1 ES reference number. In some instances where the effect covers a large area, a box without hatching but with a label, is shown. Only maps which have been amended as a result of the SES1 and the AP1 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 hatching.

Each Volume 5 map is annotated to describe the change to a receptor or significant effect, and to give the SES1 and the AP1 ES reference number. For more detailed information about the SES1 and the AP1 ES annotation, refer to the map series legend. Only maps which have been amended as a result of the SES1 and the AP1 ES are included within the map book.

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 left hand side of the page, and Manchester to the right.

The exception to this, are map series LV-00, LV-02, LV-07 and LV-08, 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 Manchester to the top.

Further details on the approach to mapping is set out in Section 6 of Volume 1 of the SES1 and AP1 ES.

Map books

In total, there are 14 map books included in the SES1 and AP1 ES Volume 2 and Volume 5. A list of the map book titles and map series is provided below for reference.

Map book title (map series)	Name
Volume 2: Map book – MA01: Hough to Walley's Green (CT-05, CT-06, CT-10, LV-01, LV-03, LV-04, SV-05)	Volume 5: Map book – Land quality (LQ-01)
Volume 2: Map book – MA02: Wimboldsley to Lostock Gralam (CT-05, CT-06, CT-10, LV-01, LV-03, LV-04, SV-05)	Volume 5: Map book – Landscape and visual (LV-00, LV-02, LV-07, LV-08, LV-17)
Volume 2: Map book – MA03: Pickmere to Agden and Hulseheath (CT-05, CT-06, CT-10, LV-01, LV-03, LV-04, SV-05)	Volume 5: Map book – Planning Data/Committed Development (CT-13)
Volume 5: Map book – Agriculture (AG-01, AG-04)	Volume 5: Map book – Socio-economics (SE-01)
Volume 5: Map book – Air quality (AQ-01)	Volume 5: Map book – Sound, noise and vibration (SV-02, SV-03, SV-08, SV-09)
Volume 5: Map book – Community (CM-01)	Volume 5: Map book – Traffic and transport (TR-03, TR-04, TR-08)
Volume 5: Map book – Ecology and biodiversity (EC-01)	Volume 5: Map book – Water resources and flood risk (WR-02)

High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

Data dictionary and definitions

Data dictionary and definitions

Legend features	Definition	Source	Copyright
Airborne noise 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 in Volume 5, Appendix SV-003-0MA0X.	High Speed Two (HS2) Ltd	
Airborne noise 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 in Volume 5, Appendix SV-003-0MA0X.	High Speed Two (HS2) Ltd	
Airborne noise 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	
Airborne noise, 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 and vibration reports in Volume 5, Appendix SV-003-0MA0X.	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-002-0MA0X, which also describes how these are linked to baseline levels at assessment locations.	High Speed Two (HS2) Ltd	
Committed developments - SV only	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	
Community area boundary	The Environmental Statement has been split into sections called Community Areas.	High Speed Two (HS2) Ltd	© Crown copyright. Reproduced by permission of Ordnance Survey Licence Number 100049190. Year of Publication 2019.
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-002-0MA0X.	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-002-0MA0X.	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-002-0MAOX.	High Speed Two (HS2) Ltd	
County boundary	County boundaries from Ordnance Survey boundary mapping.	Ordnance Survey	© Crown copyright. Reproduced by
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 2021.
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 features further reducing noise effects	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). 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.	High Speed Two (HS2) Ltd	
Envisaged mitigation to avoid / reduce significant noise effects	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. Engineering e.g. cuttings: 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.	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
Ground-borne noise & 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 noise & 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 assessed. This area is defined as within 85m of the route.	High Speed Two (HS2) Ltd	
Ground-borne noise 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-003-0MA0X.	High Speed Two (HS2) Ltd	
Ground-borne noise or vibration impact	Buildings at which an operational ground-borne sound or vibration impact is predicted from the Proposed Scheme.	High Speed Two (HS2) Ltd	
Land potentially required during construction	Boundary defining the maximum possible extent of construction works required to build HS2 as far as the current level of design allows. This only covers surface works and includes all tunnel portals, vent shafts and headhouses, but does not apply to wholly tunnelled sections or to air rights. It also encompasses associated highway, access, drainage and utility works.	High Speed Two (HS2) Ltd	
LpAFmax exceeds 60dB façade	Assessment locations where the predicted value of LpAFmax is 60 dB or greater having applied a façade correction of +2.5 dB to the predicted free field value.	High Speed Two (HS2) Ltd	
Noise Important Areas defined in national noise action plans (Defra 2014)	The Environmental Noise (England) Regulations 2006 (SI 2006/2238) required Defra, as the Competent Authority, to implement the Environmental Noise Directive in England, which requires amongst other things, the adoption of Action Plans, based upon the noise exposure assessment results. The noise action plan(s) "apply in particular to the most important areas as established by the strategic noise maps". These identified areas are referred to as noise important areas.	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 noise impacts at residential 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 SV-001-00000). Panel B on SV02/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-001-00000).	High Speed Two (HS2) Ltd	

Legend features	Definition	Source	Copyright
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-001-00000).	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-001-00000).	High Speed Two (HS2) Ltd	
Route in bored tunnel Route in green tunnel	Represents the proposed route of HS2, split into route in bored tunnel and route in green tunnel sections.	High Speed Two (HS2) Ltd	
Route on surface	Represents the proposed route of HS2, split into route on surface and tunnelled sections.	High Speed Two (HS2) Ltd	
Sound contours	The sound levels from the Proposed Scheme (expressed as LpAeq,T and representing sound from the new railway only) are presented as contours lines, which represent equal sound levels. Further details regarding contour values are provided on the SV-02, SV-05, SV-08 and SV-09 map series.	High Speed Two (HS2) Ltd	

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High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

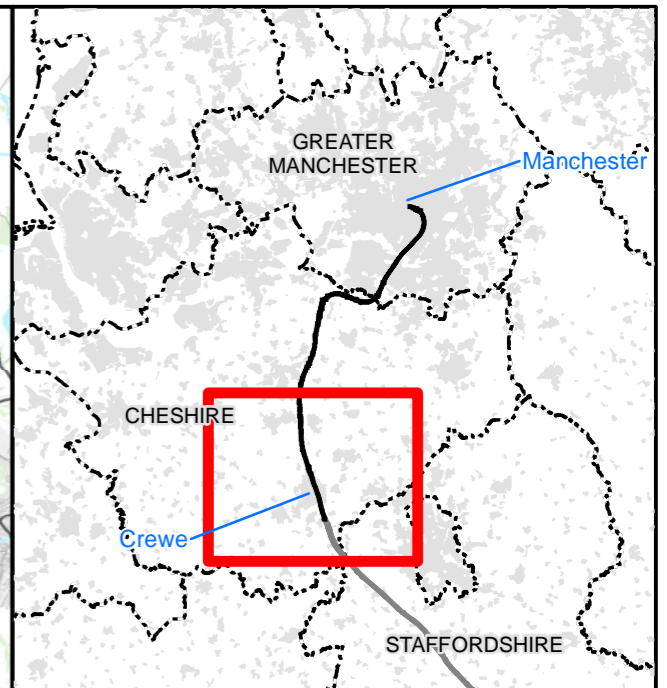
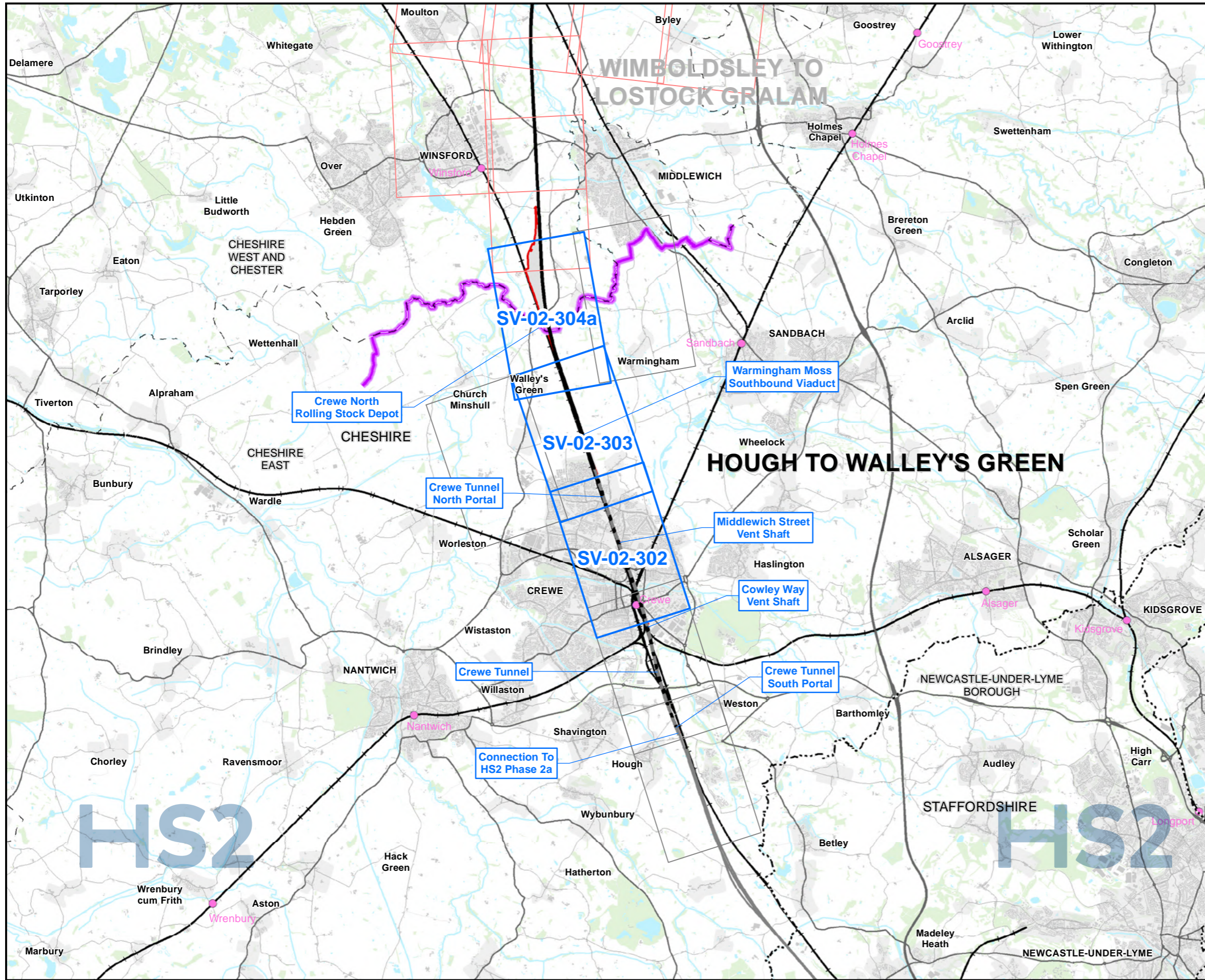
MA01: Hough to Walley's Green

SV-02 – Operational Airborne Noise and Vibration Impacts and
Likely Significant Effects

SV-03 – Construction Airborne Noise and Vibration
Likely Significant Effects

SV-08 – Day-time Operational Sound Contour Maps

SV-09 – Night-time Operational Sound Contour Maps



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-08 and SV-09 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-003-00000; 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-003-00000.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures and on the separate legend page 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 area boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community area
- Map sheets included in this community area with no amendment
- Map sheets not included in this community area

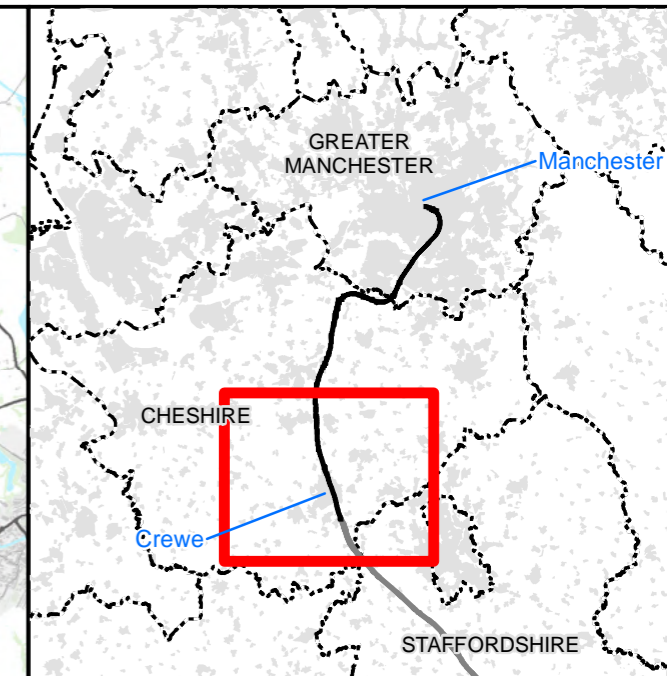
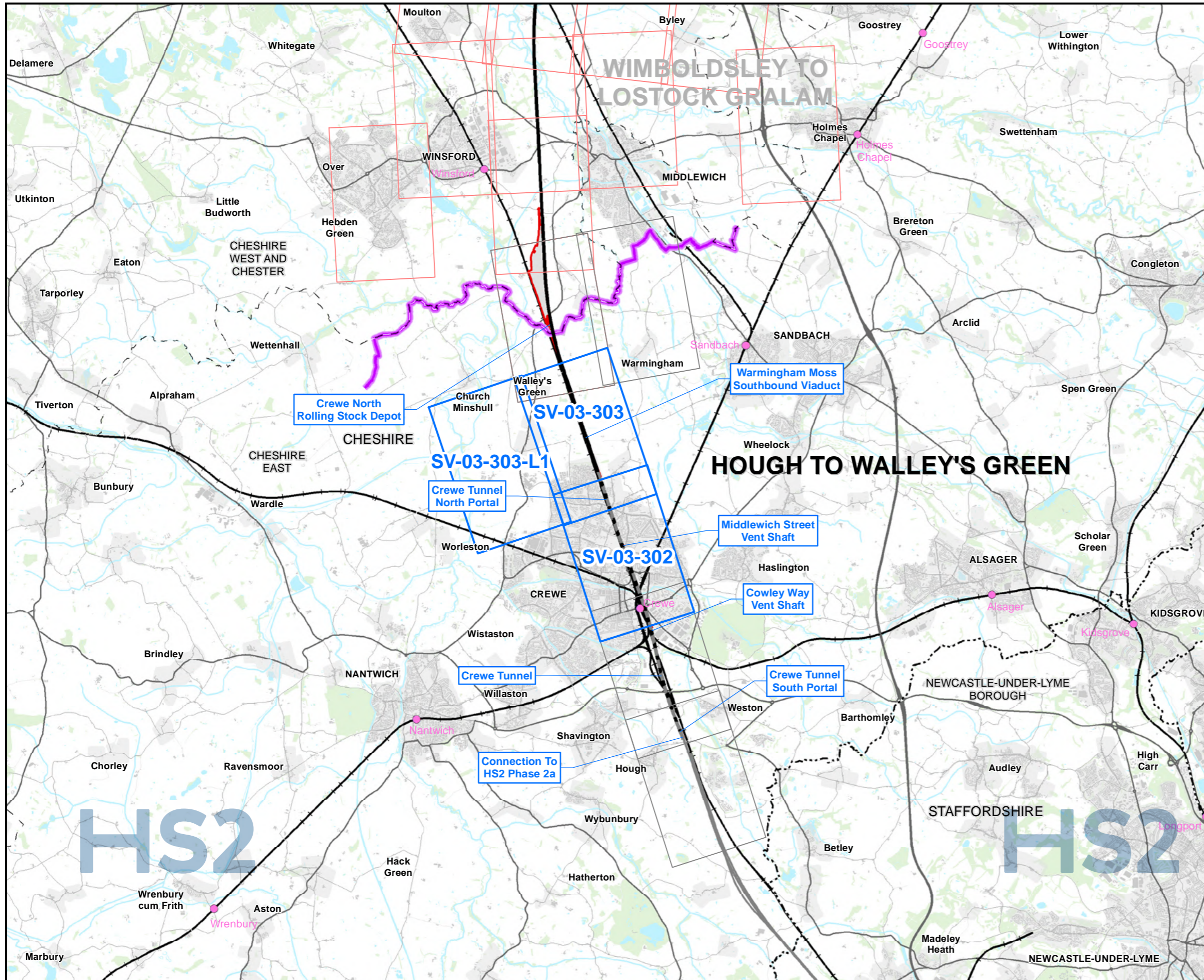
Map Number	SV-02-INDEX-MA01
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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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-002-00000.

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-002-00000.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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 area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

Map Number	SV-03-INDEX-MA01
Map Name	Index Map of: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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Date: 19/04/22

HS2 (rail only) noise level $L_{p,Aeq,T}$		Potential noise effect ^{1, 2}	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	Daytime $L_{p,Aeq,T}$ (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 SV-003-00000. Likely significant effect indicated by MA0X-O-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on noise level change and significance criteria. Likely significant effects on groups of dwellings and any shared community open areas indicated by MA0X-O-C# ²	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

Operational airborne noise impacts at residential buildings¹

-  Major adverse
-  Moderate adverse
-  Minor adverse
-  Negligible
-  Beneficial




-  Potential additional noise insulation (triggered by maximum noise 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
-  L_{pAFmax} exceeds 60dB façade
HS2 train only L_{pAFmax} +2.5dB façade correction

 Ground-borne noise or vibration impact at residential buildings

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY). SES/AP change ref.

Significant effect descriptor

 Removed effect  Added effect  Different effect

¹ For further information see Volume 5 Appendix SV-001-00000

² For further details of the SES/AP1 ES assessment see Volume 5 Appendix SV-003-00000

Map Number SV-02 - Legend

Map Name
Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES



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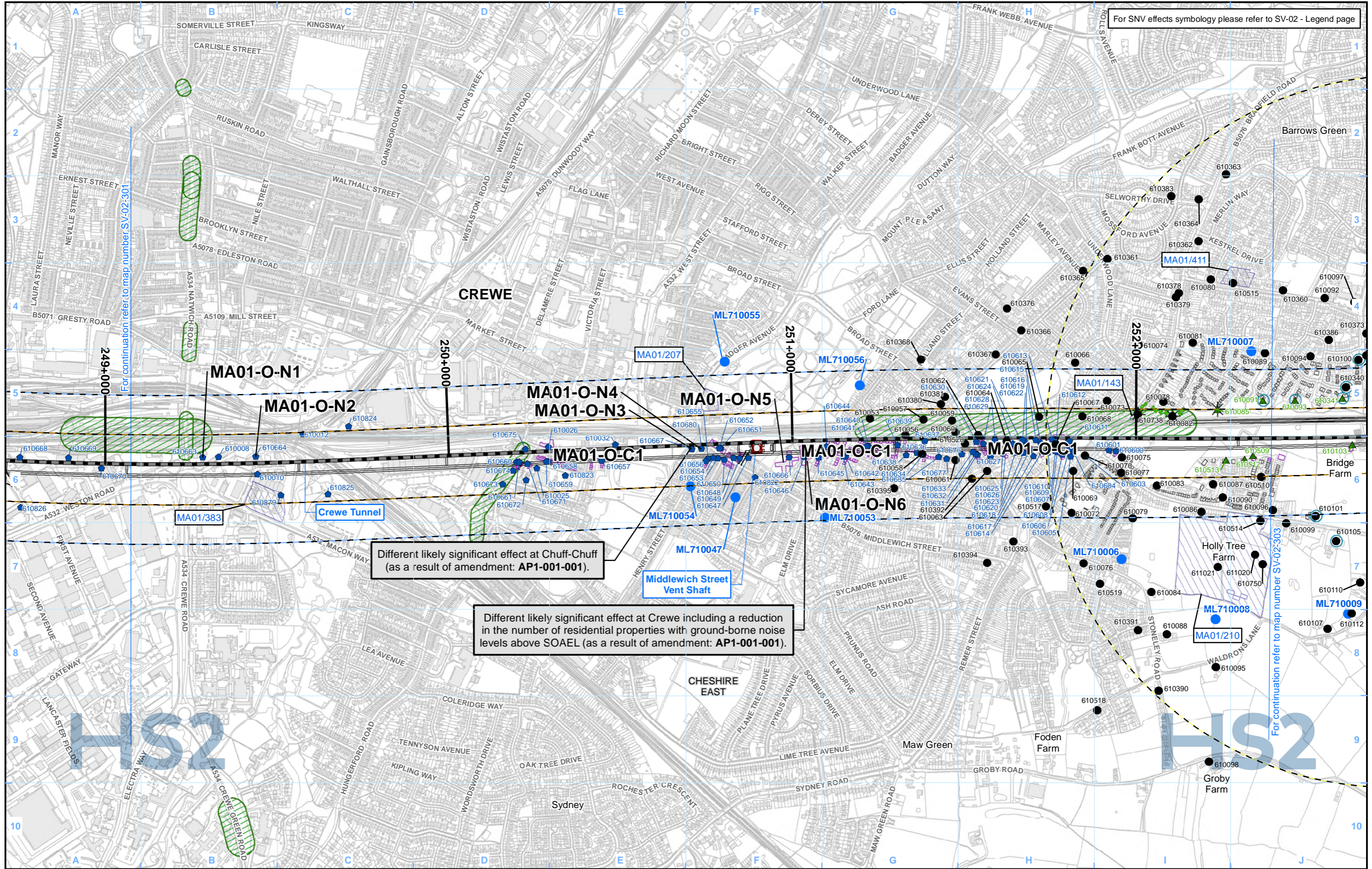
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Date:

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Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Noise related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

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

Noise Important Areas defined in national noise action plans (Defra 2014)

- Committed developments - SV Only
- Airborne noise study area

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number: SV-02-302

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA01: Hough to Walley's Green

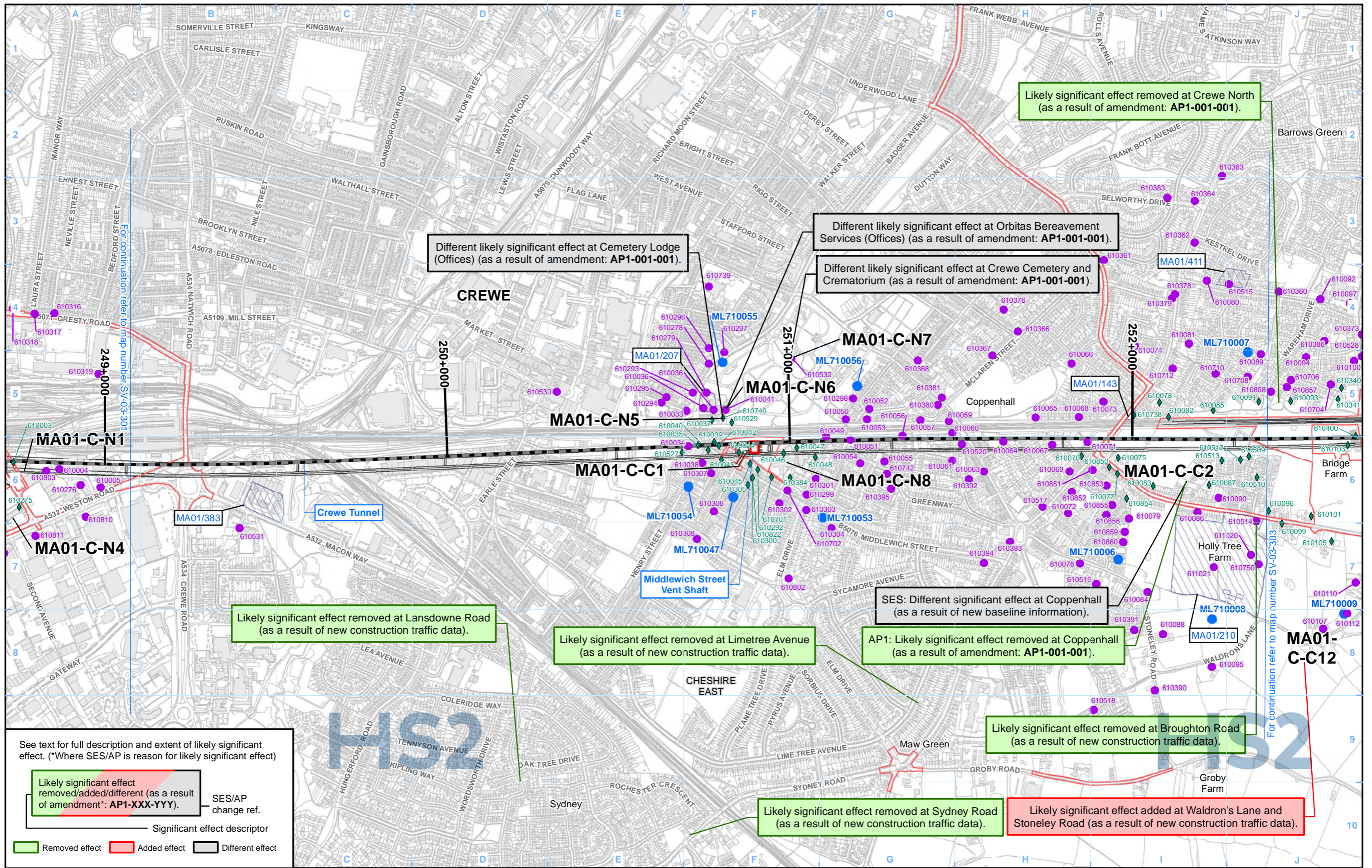
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Doc Number: 2PT24-MWJ-EV-MAP-M000-002002-P01

Date: 19/04/22



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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
—	Significant effect descriptor
	Removed effect
	Added effect
	Different effect

Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting
- Land potentially required during construction

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and/or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA01-C-C# and MA01-C-N#, respectively.

Map Number: SV-03-302

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA01: Hough to Walley's Green

HS2

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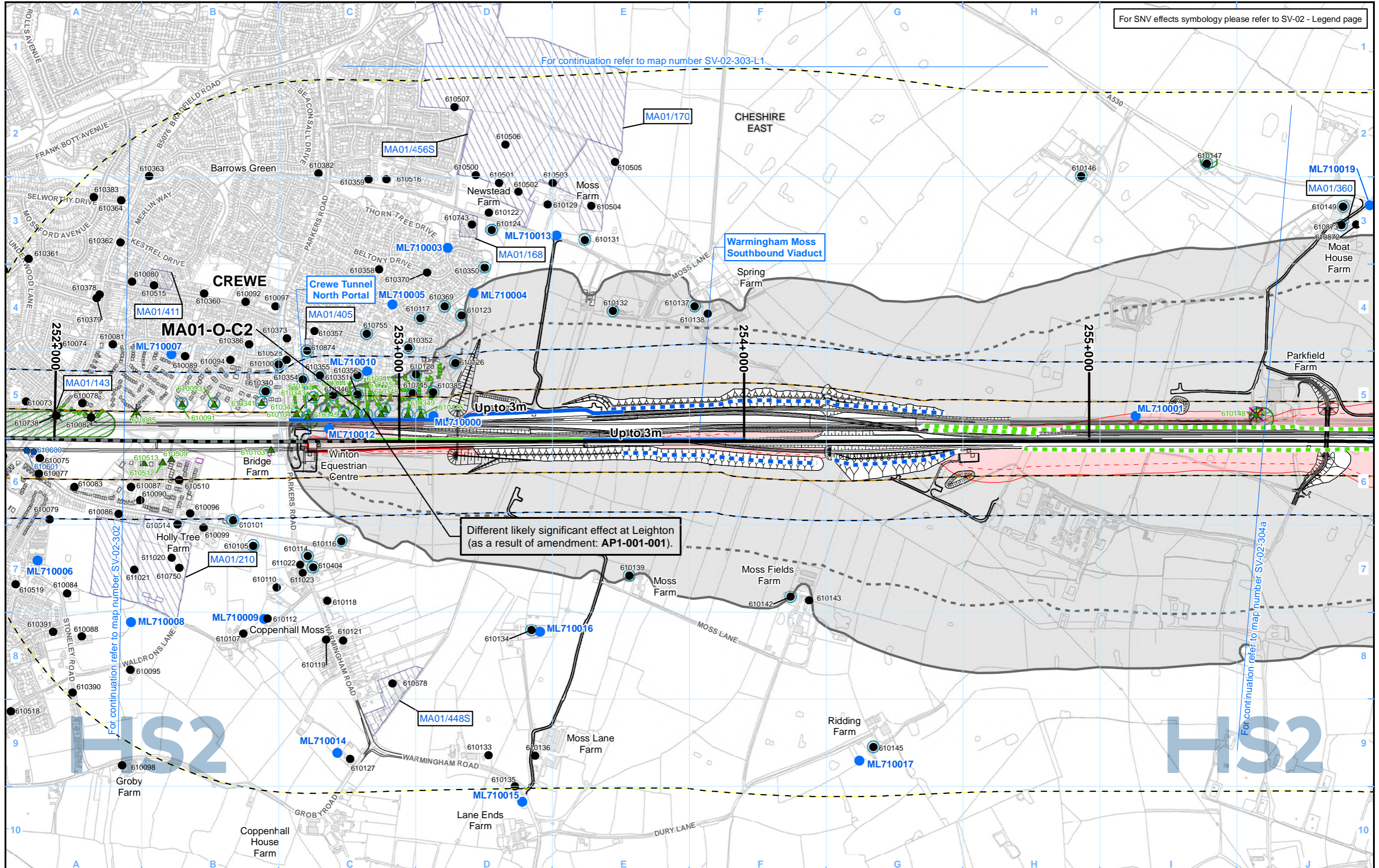
Doc Number: 2PT24-MWJ-EV-MAP-M000-002049-P01

Date: 19/04/22

Scale at A3: 1:10,000

Metres

For continuation refer to map number SV-02-303-L1



Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting
- Non engineering earthworks:**
- Embankment
- Cutting

Legend - Noise related features

- Envisaged mitigation to avoid / reduce significant noise effects:**
- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
- Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:**
- Other environmental e.g. landscaping
- Engineering e.g. cuttings

Legend - Noise related features

- Noise Important Areas defined in national noise action plans (Defra 2014)
- Committed developments - SV Only
- Airborne noise study area

Legend - Noise related features

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-02-303

Map Name Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA01: Hough to Walley's Green

HS2

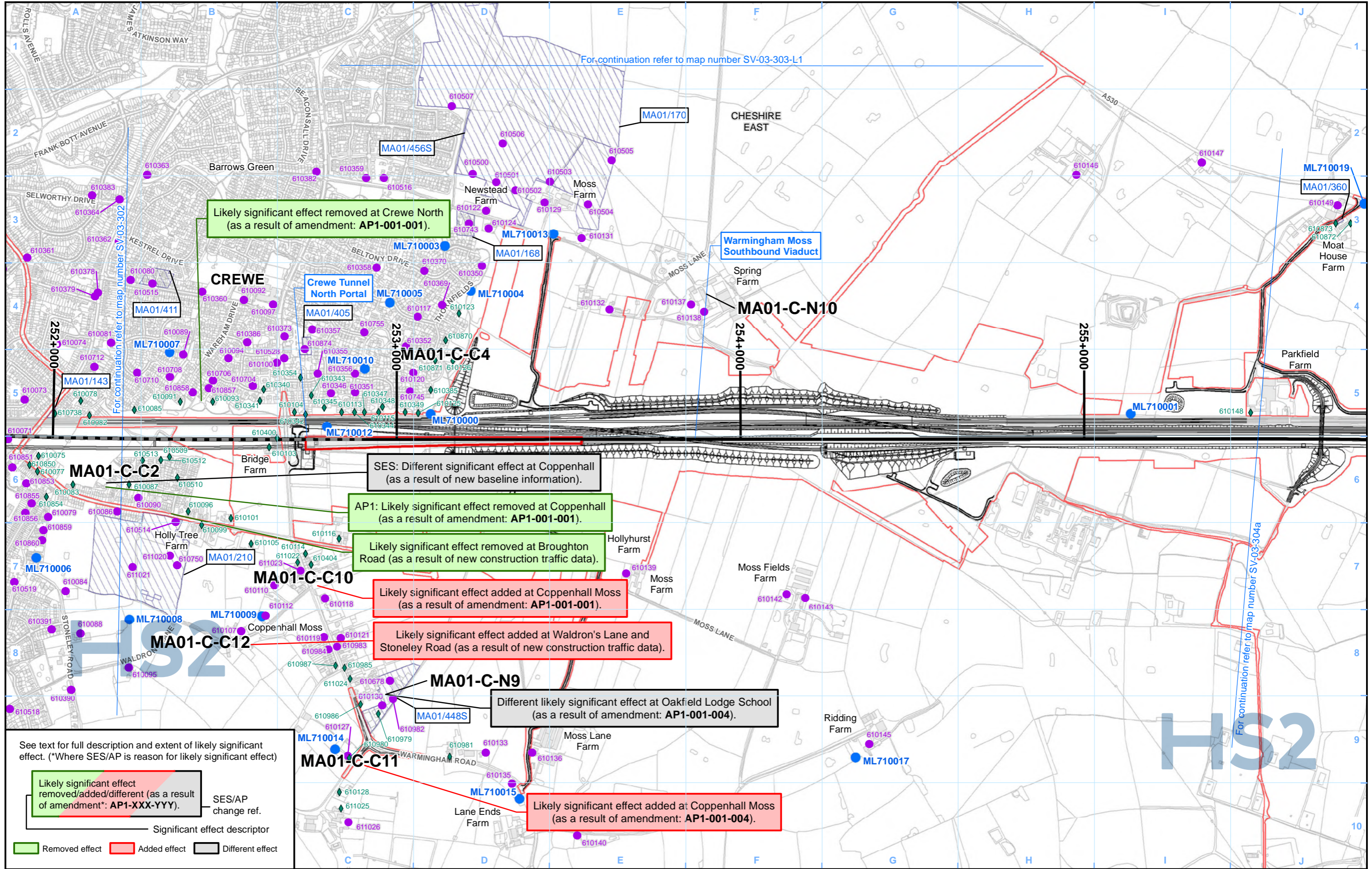
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For continuation refer to map number SV-03-303-L1



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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY). SES/AP change ref.

— Significant effect descriptor

Removed effect Added effect Different effect

Legend - General features

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

Legend - Sound related features

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA01-C-# and MA01-C-N#, respectively.

Map Number: SV-03-303

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA01: Hough to Walley's Green

HS2

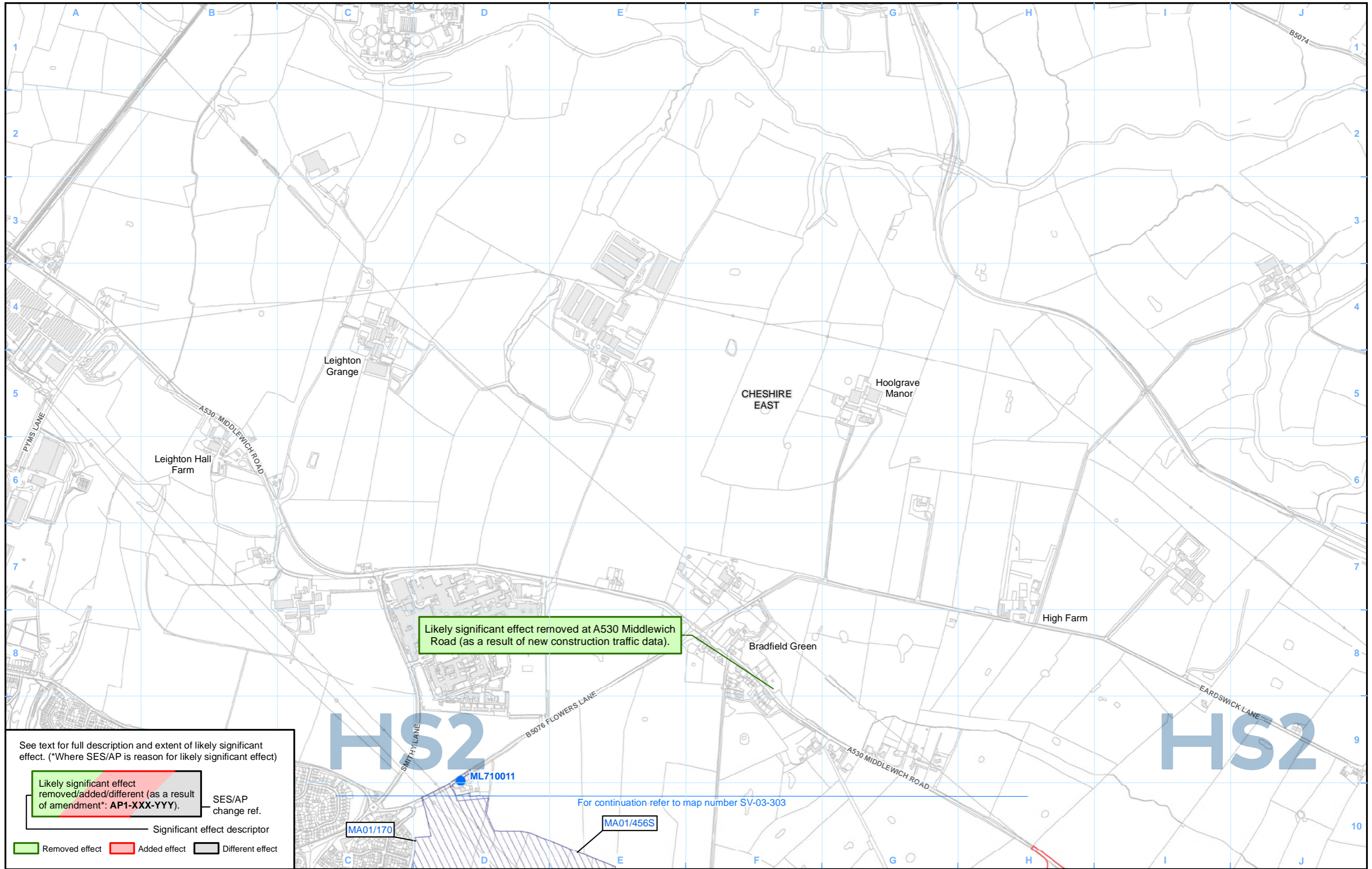
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Date: 19/04/22

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
—	Significant effect descriptor
Removed effect	Added effect
Different effect	

Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting
- Land potentially required during construction

Non engineering earthworks:

- Embankment
- Cutting

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA01-C-C# and MA01-C-N#, respectively.

For continuation refer to map number SV-03-303

Map Number: SV-03-303-L1

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA01: Hough to Walley's Green

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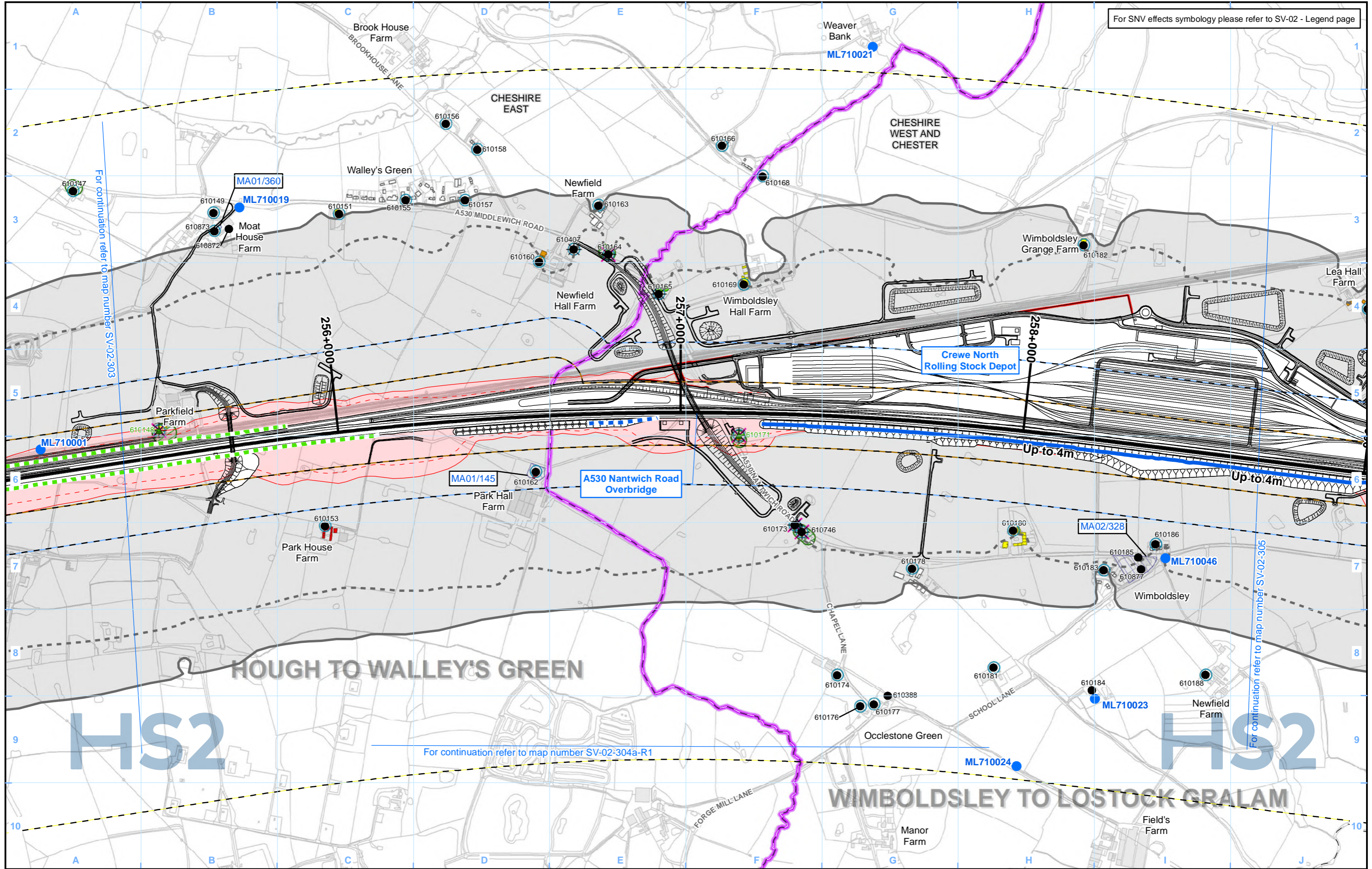
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Doc Number: 2DE01-MWJ-EV-MAP-M000-002890-P01

Date: 19/04/22

For SNV effects symbology please refer to SV-02 - Legend page



Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Noise related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

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

Noise Important Areas defined in national noise action plans (Defra 2014)

- Committed developments - SV Only
- Airborne noise study area

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number: SV-02-304a

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA01: Hough to Walley's Green

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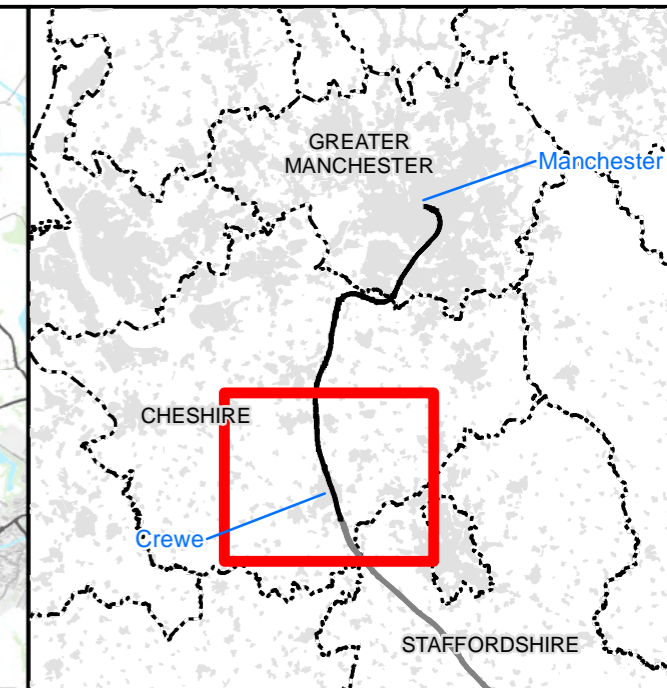
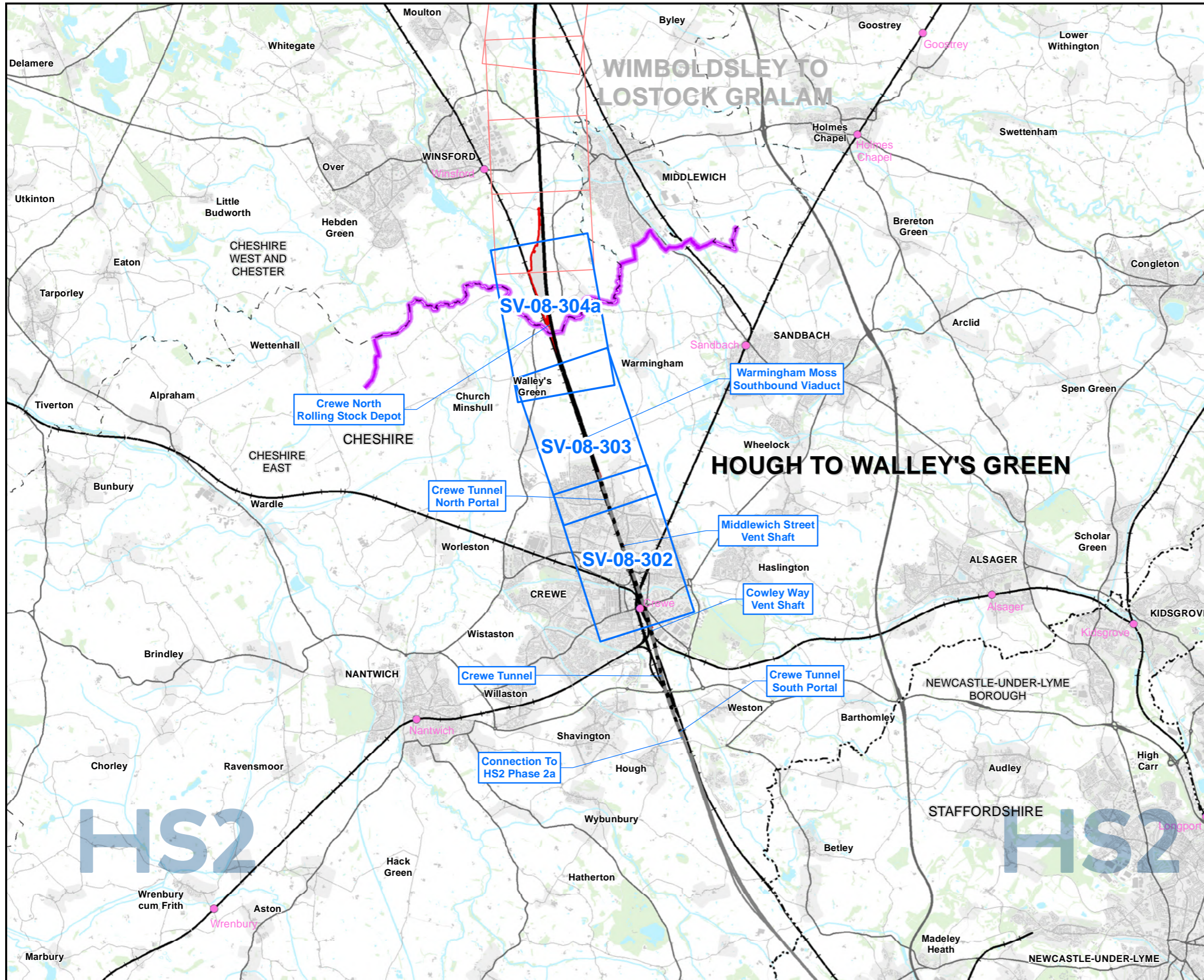
Doc Number: 2PT24-MWJ-EV-MAP-M000-002004-P01

Date: 19/04/22

Scale at A3: 1:10,000

Metres

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Map Series Information:

SV-08 presents the predicted daytime operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{p,Aeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; this panel contains a key communicating the daytime sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-09, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-08 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;
- 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.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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 area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

Map Number	SV-08-INDEX-MA01
Map Name	Index Map of: Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

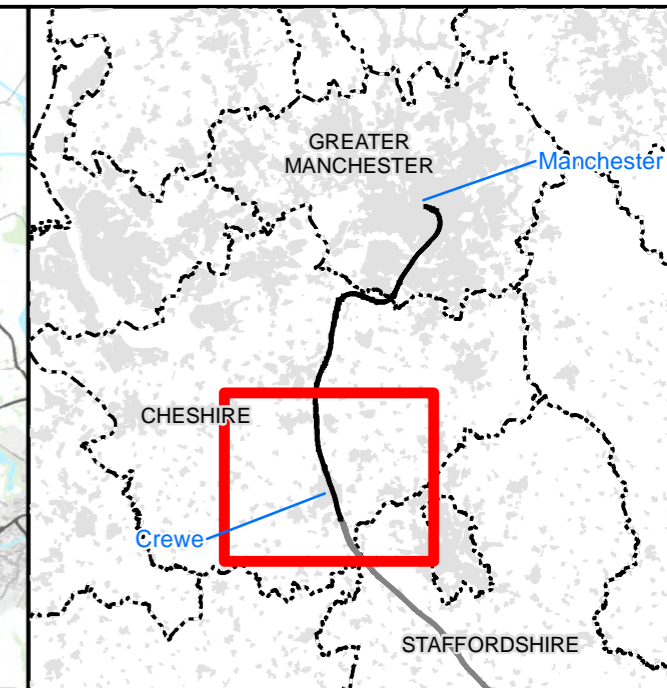
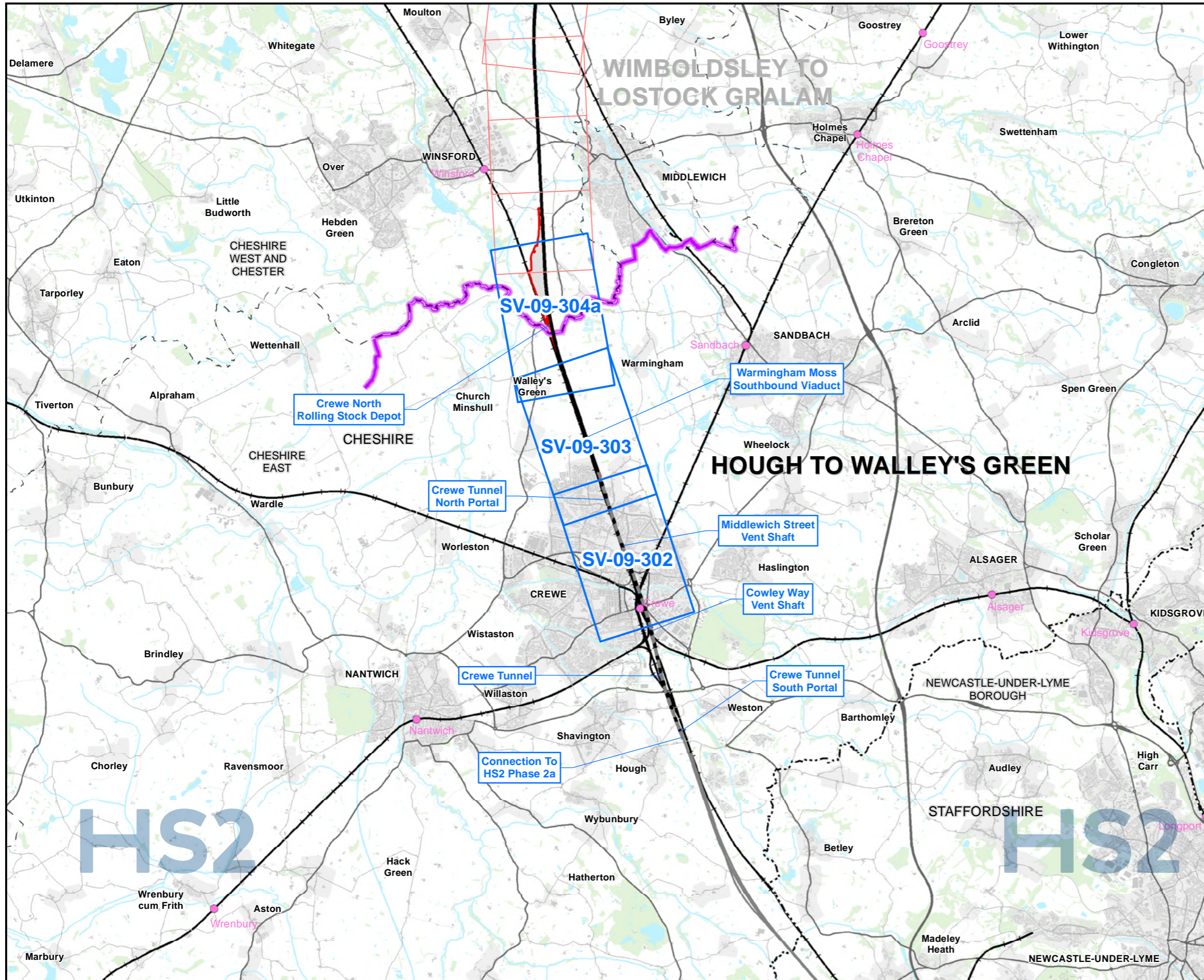
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Doc Number: 2PT24-MWJ-EV-MAP-M000-003072-P01
Date: 19/04/22



Map Series Information:

SV-09 presents the predicted night-time operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{p,Aeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; this panel contains a key communicating the night-time sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-08, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-09 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;
- 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.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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

Map Number	SV-09-INDEX-MA01
Map Name	Index Map of: Night-time Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

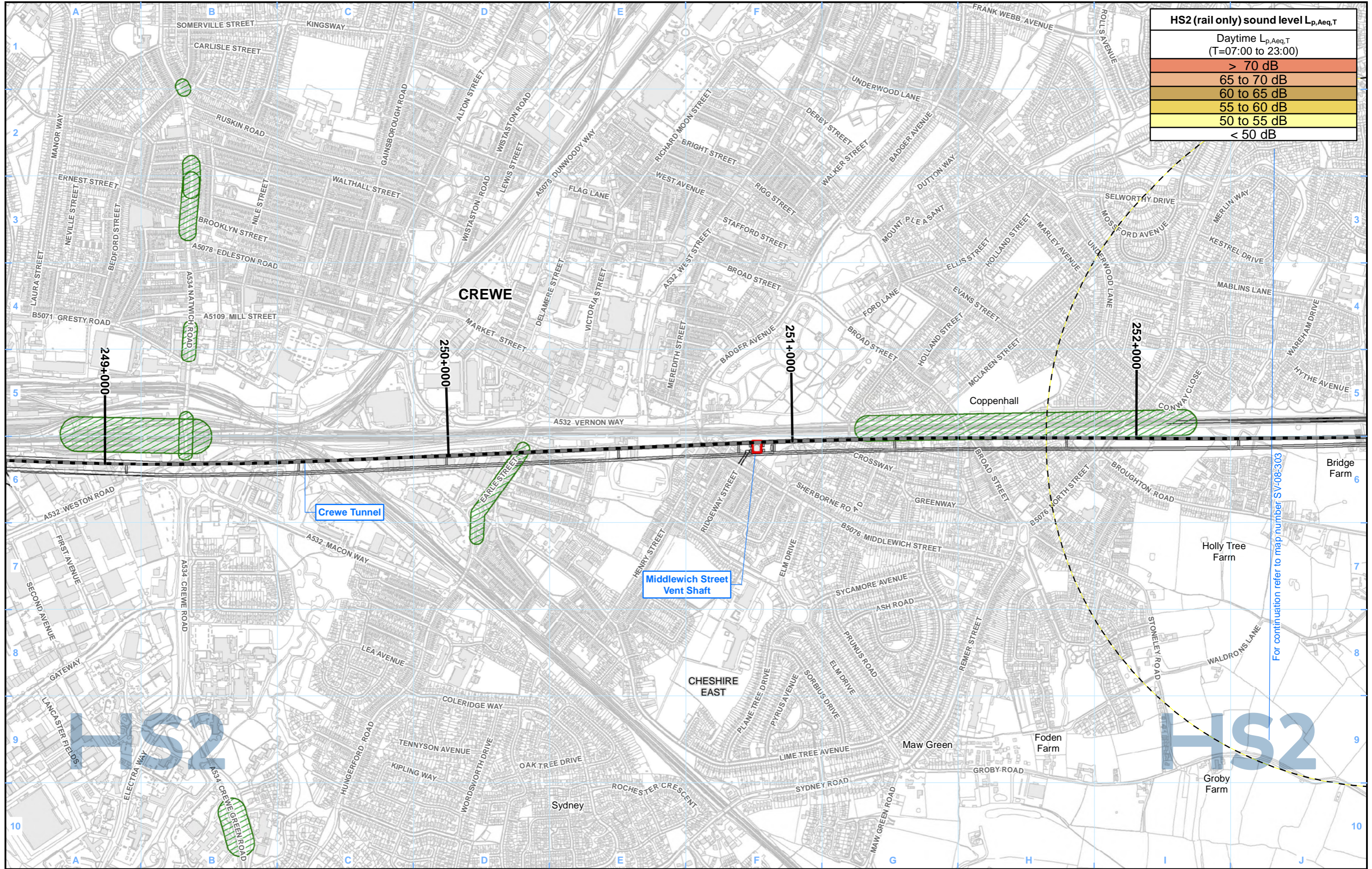
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Doc Number: 2PT24-MWJ-EV-MAP-M000-003113-P01
Date: 19/04/22



HS2 (rail only) sound level L _{p,Aeq,T}	
Daytime L _{p,Aeq,T} (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	< 50 dB

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:**
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

Legend - Sound related features

- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

* Labelled with total barrier height above rail level

Map Number	SV-08-302
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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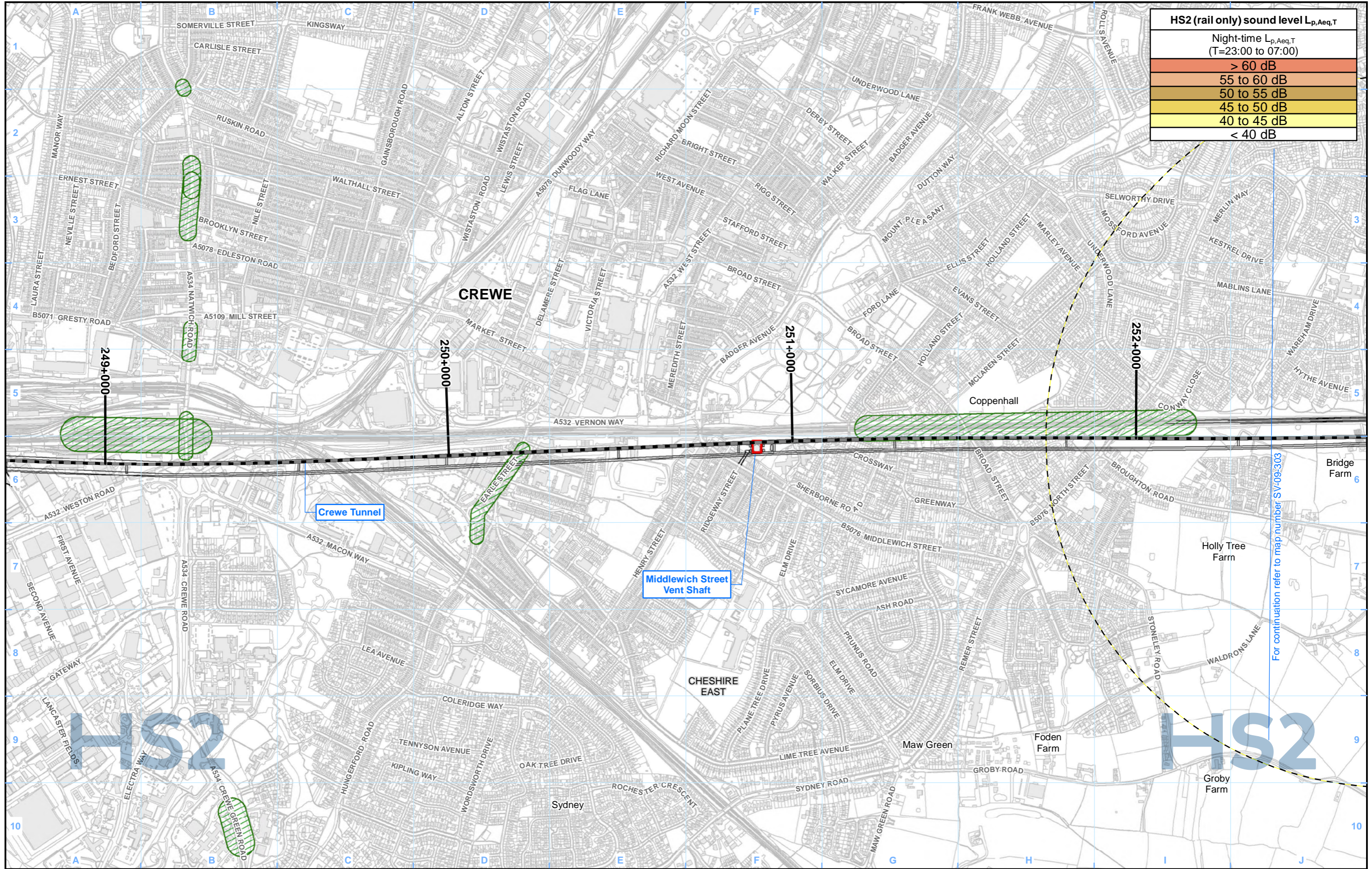
Doc Number: 2PT24-MWJ-EV-MAP-M000-003081-P01

Scale at A3: 1:10,000

Metres

Date: 19/04/22

For continuation refer to map number SV-08-303



HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
	> 60 dB
	55 to 60 dB
	50 to 55 dB
	45 to 50 dB
	< 40 dB

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:**
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- * Labelled with total barrier height above rail level
- Airborne noise study area:**
- Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)

Map Number	SV-09-302
Map Name	Night-time Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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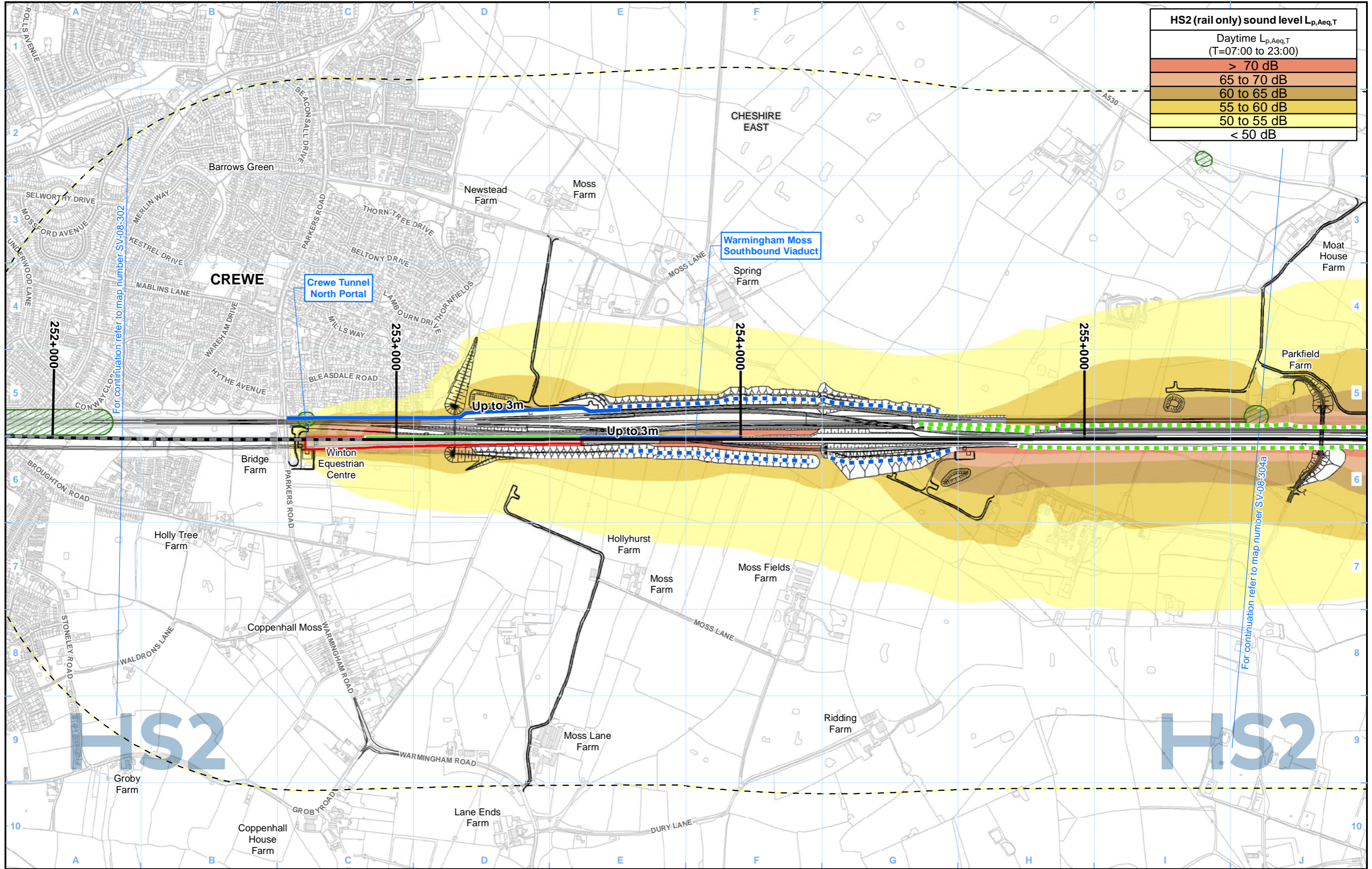
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Doc Number: 2PT24-MWJ-EV-MAP-M000-003122-P01

Scale at A3: 1:10,000

Date: 19/04/22

HS2 (rail only) sound level L _{p,Aeq,T}	
Daytime L _{p,Aeq,T} (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	50 to 55 dB
	< 50 dB



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:**
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

Legend - Sound related features

- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

- * Labelled with total barrier height above rail level

Map Number	SV-08-303
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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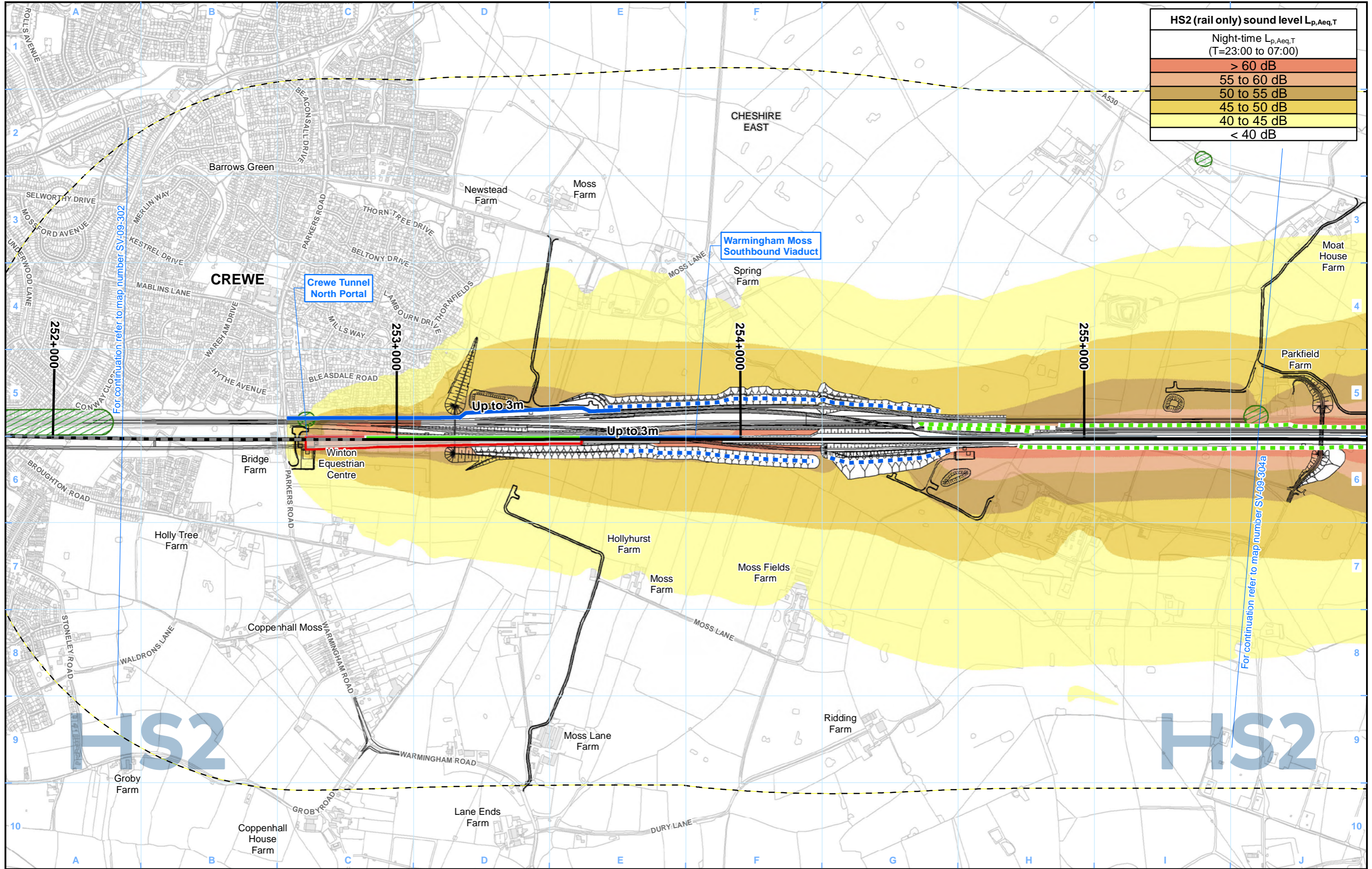
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Date: 19/04/22

HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
	> 60 dB
	55 to 60 dB
	50 to 55 dB
	45 to 50 dB
	40 to 45 dB
	< 40 dB



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- * Labelled with total barrier height above rail level
- Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)

Map Number	SV-09-303
Map Name	Night-time Operational Sound Contour Maps SES1 and AP1 ES
	Community Area MA01: Hough to Walley's Green

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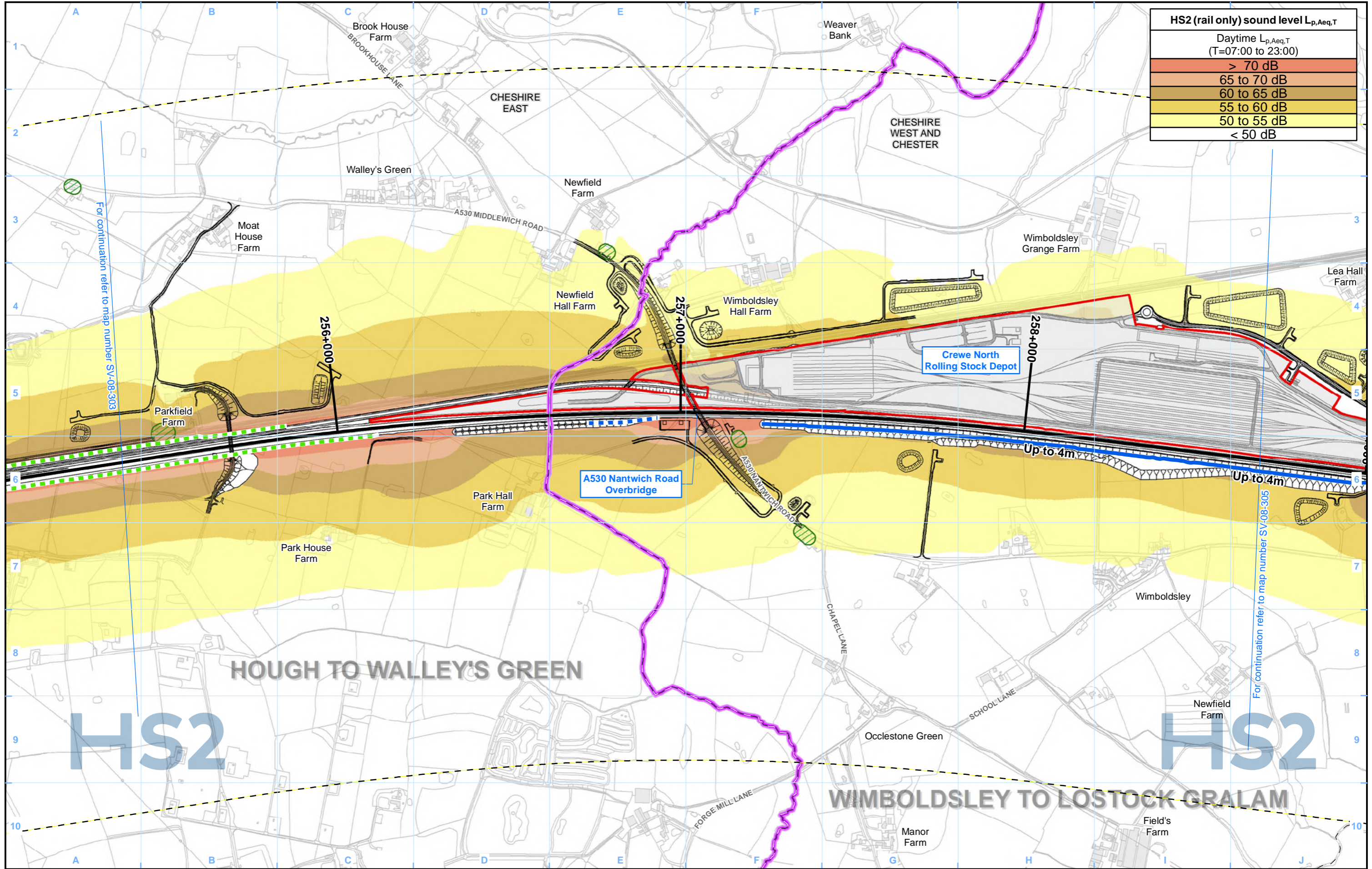
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Scale at A3: 1:10,000

Metres

Date: 19/04/22

HS2 (rail only) sound level L _{p,Aeq,T}	
Daytime L _{p,Aeq,T} (T=07:00 to 23:00)	
> 70 dB	(Dark Red)
65 to 70 dB	(Red)
60 to 65 dB	(Orange)
55 to 60 dB	(Yellow-Orange)
50 to 55 dB	(Yellow)
< 50 dB	(Light Yellow)



Legend - General features

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

Engineering earthworks:

	Embankment
	Cutting

Non engineering earthworks:

	Embankment
	Cutting

Legend - Sound related features

	Envisaged mitigation to avoid / reduce significant noise effects:		Airborne noise study area
	Landscaping and/or fence barriers*		Noise Important Areas defined in national noise action plans (Defra 2019)
	Engineering e.g. cuttings (green tunnels separately marked)		
Envisaged features further reducing noise effects:			
	Other environmental e.g. landscaping		
	Engineering e.g. cuttings		

* Labelled with total barrier height above rail level

Map Number	SV-08-304a
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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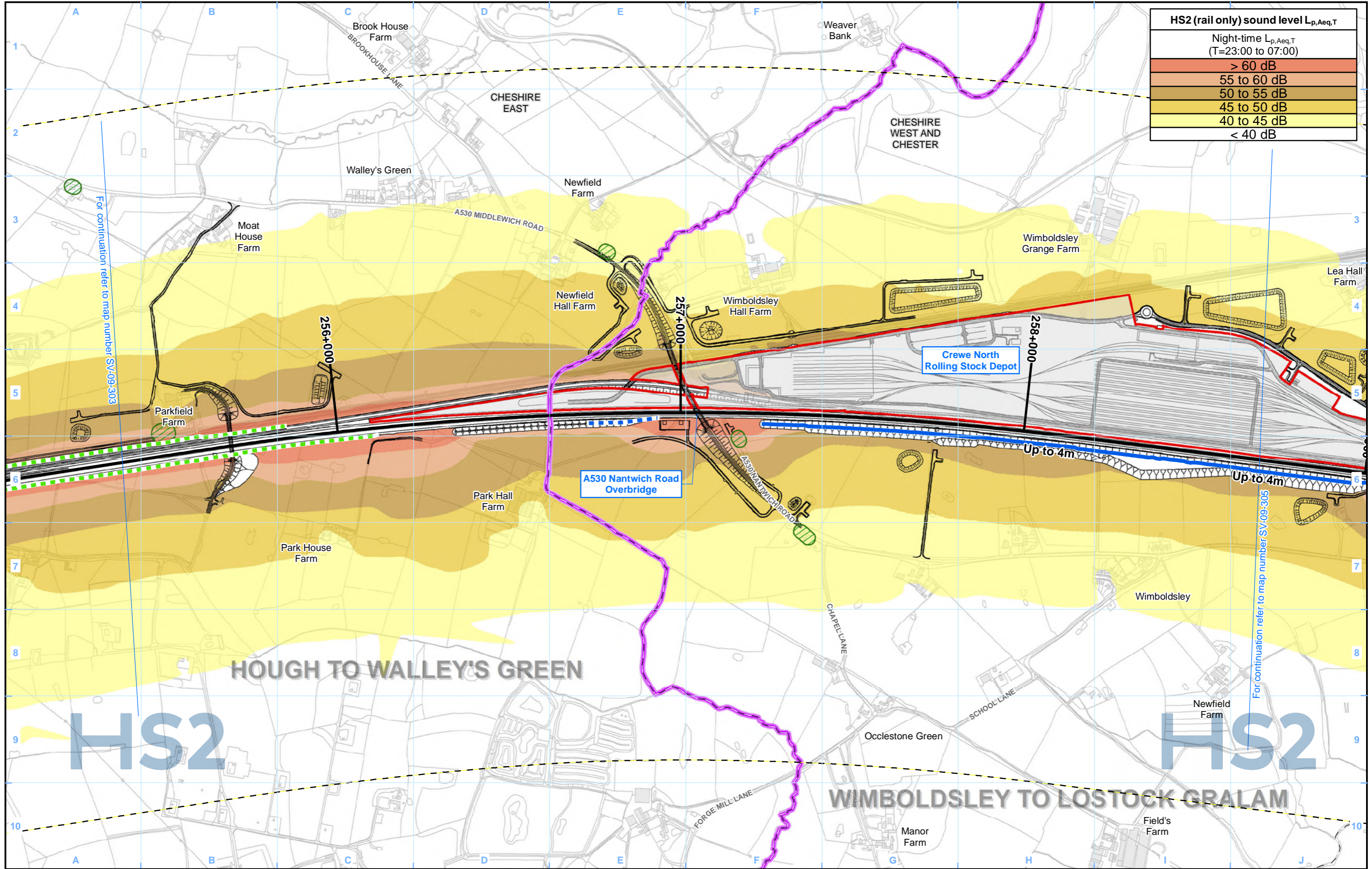
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Scale at A3: 1:10,000

Date: 19/04/22

HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
> 60 dB	(Dark red)
55 to 60 dB	(Red)
50 to 55 dB	(Orange)
45 to 50 dB	(Yellow)
40 to 45 dB	(Light yellow)
< 40 dB	(White)



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

* Labelled with total barrier height above rail level

- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

Map Number	SV-09-304a
Map Name	Night-time Operational Sound Contour Maps SES1 and AP1 ES Community Area MA01: Hough to Walley's Green

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Date: 19/04/22

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Metres

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High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

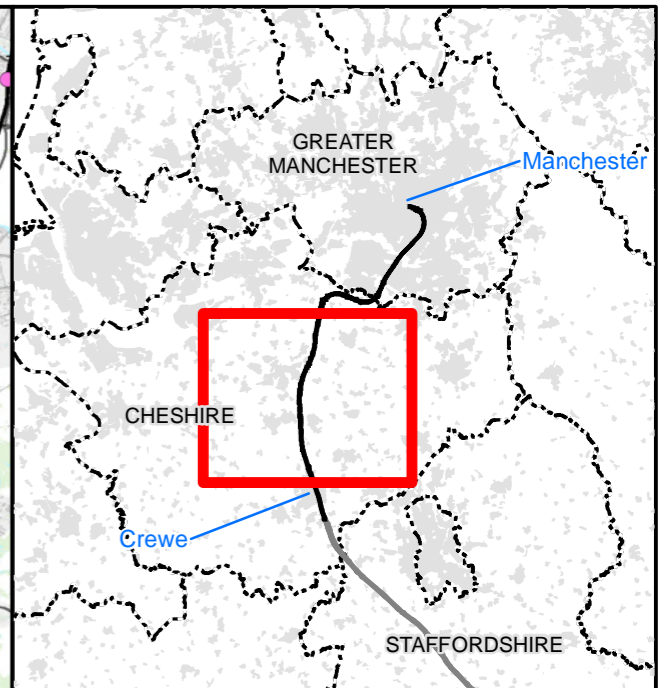
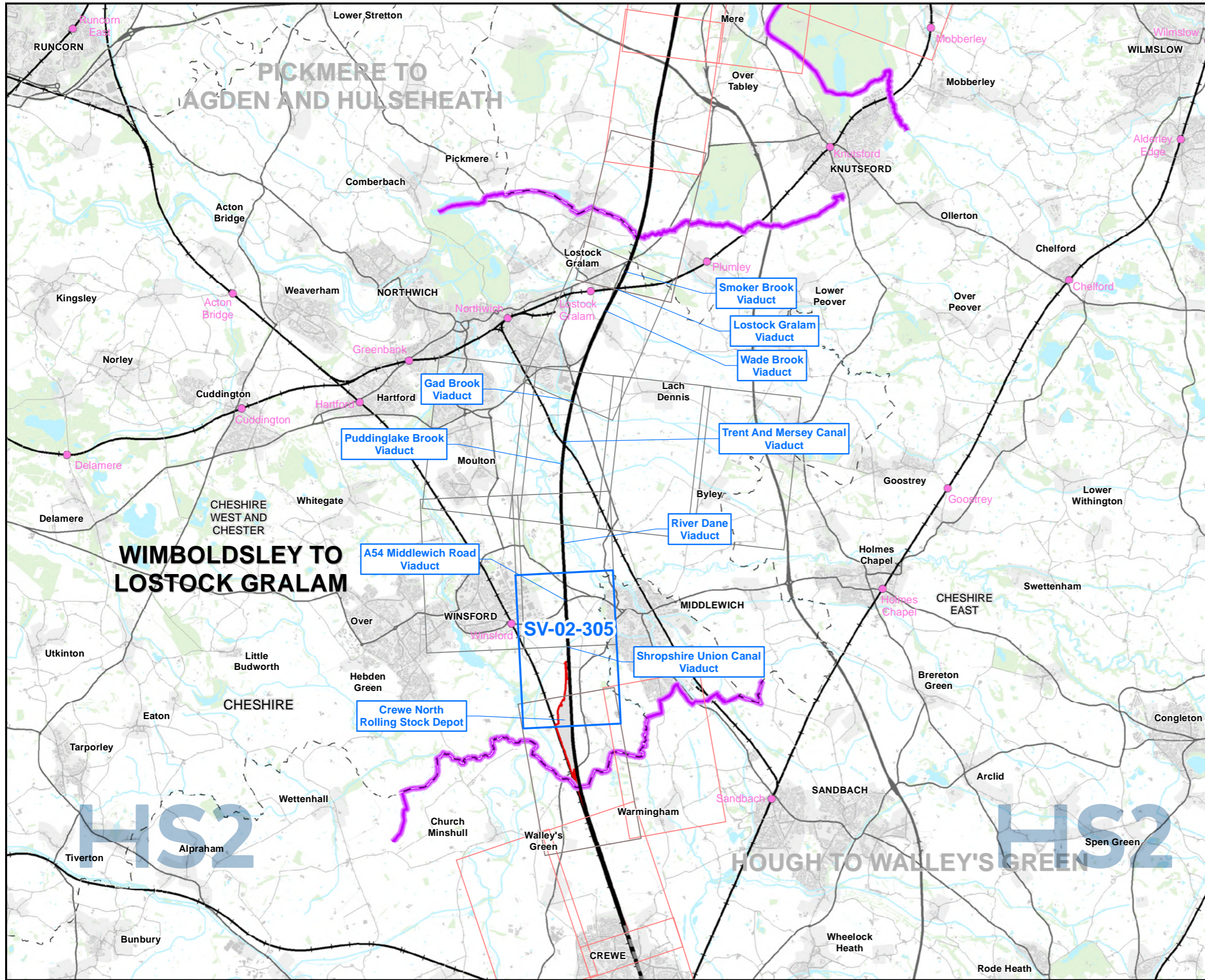
MA02: Wimboldsley to Lostock Gralam

SV-02 – Operational Airborne Noise and Vibration Impacts and
Likely Significant Effects

SV-03 – Construction Airborne Noise and Vibration
Likely Significant Effects

SV-08 – Day-time Operational Sound Contour Maps

SV-09 – Night-time Operational Sound Contour Maps



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-08 and SV-09 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-003-00000; 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-003-00000.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures and on the separate legend page 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 area boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community area
- Map sheets included in this community area with no amendment
- Map sheets not included in this community area

Map Number SV-02-INDEX-MA02

Map Name Index Map of:
Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

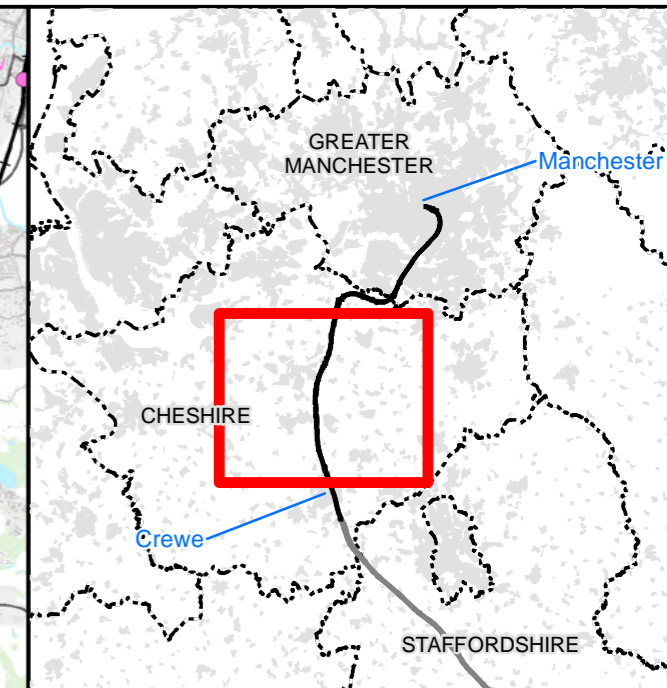
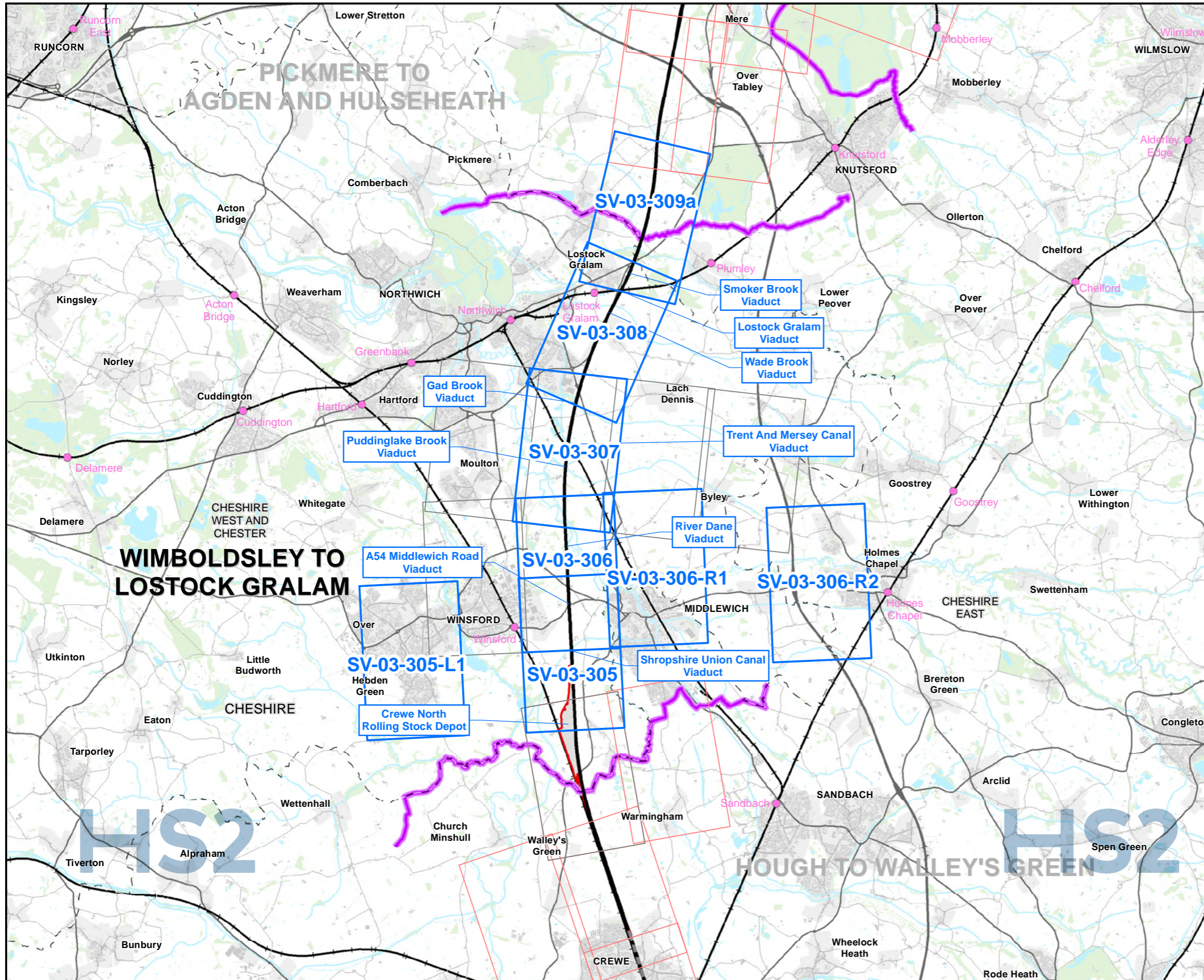
Community Area MA02:
Wimboldsley to Lostock Gralam

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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-002-00000.

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-002-00000.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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

Map Number	SV-03-INDEX-MA02
Map Name	Index Map of: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES Community Area MA02: Wimboldsley to Lostock Gralam

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

HS2 (rail only) noise level $L_{p,Aeq,T}$		Potential noise effect ^{1, 2}	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	Daytime $L_{p,Aeq,T}$ (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 SV-003-00000. Likely significant effect indicated by MA0X-O-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on noise level change and significance criteria. Likely significant effects on groups of dwellings and any shared community open areas indicated by MA0X-O-C# ²	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

Operational airborne noise impacts at residential buildings¹

- Major adverse
- Moderate adverse
- Minor adverse
- Negligible
- Beneficial

- Potential additional noise insulation (triggered by maximum noise 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
- L_{pAFmax} exceeds 60dB façade
HS2 train only L_{pAFmax} +2.5dB façade correction

Ground-borne noise or vibration impact at residential buildings

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY). SES/AP change ref.

Significant effect descriptor

Removed effect
 Added effect
 Different effect

¹ For further information see Volume 5 Appendix SV-001-00000

² For further details of the SES/AP1 ES assessment see Volume 5 Appendix SV-003-00000

Map Number SV-02 - Legend

Map Name
Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES



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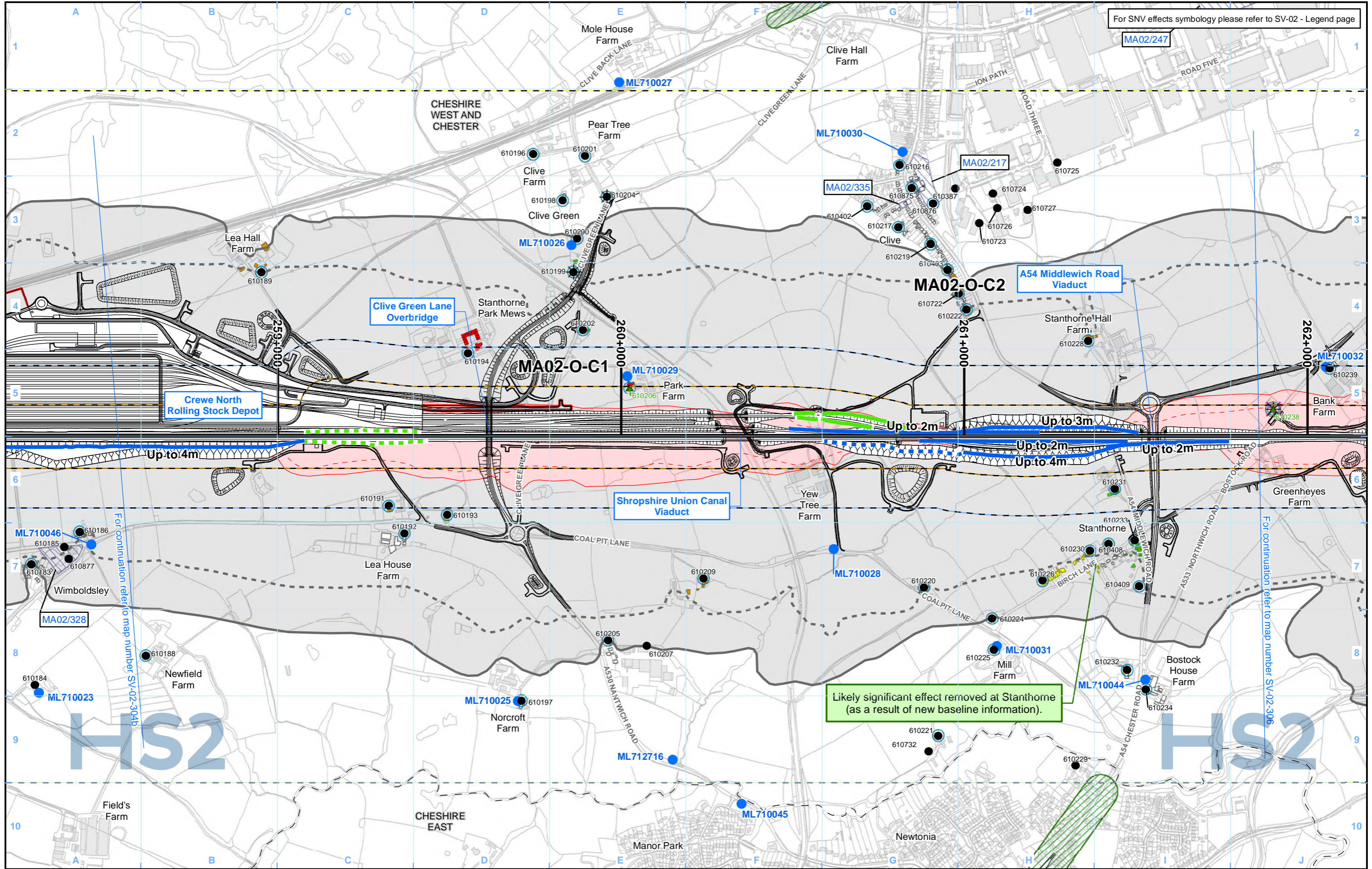
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Doc Number: -

Date:

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For SNV effects symbology please refer to SV-02 - Legend page



Legend - General features

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

Engineering earthworks:

- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting

Legend - Noise related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings

Legend - Noise related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Noise Important Areas defined in national noise action plans (Defra 2014)
 - Committed developments - SV Only
 - Airborne noise study area

Legend - Noise related features

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-02-305

Map Name Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

HS2

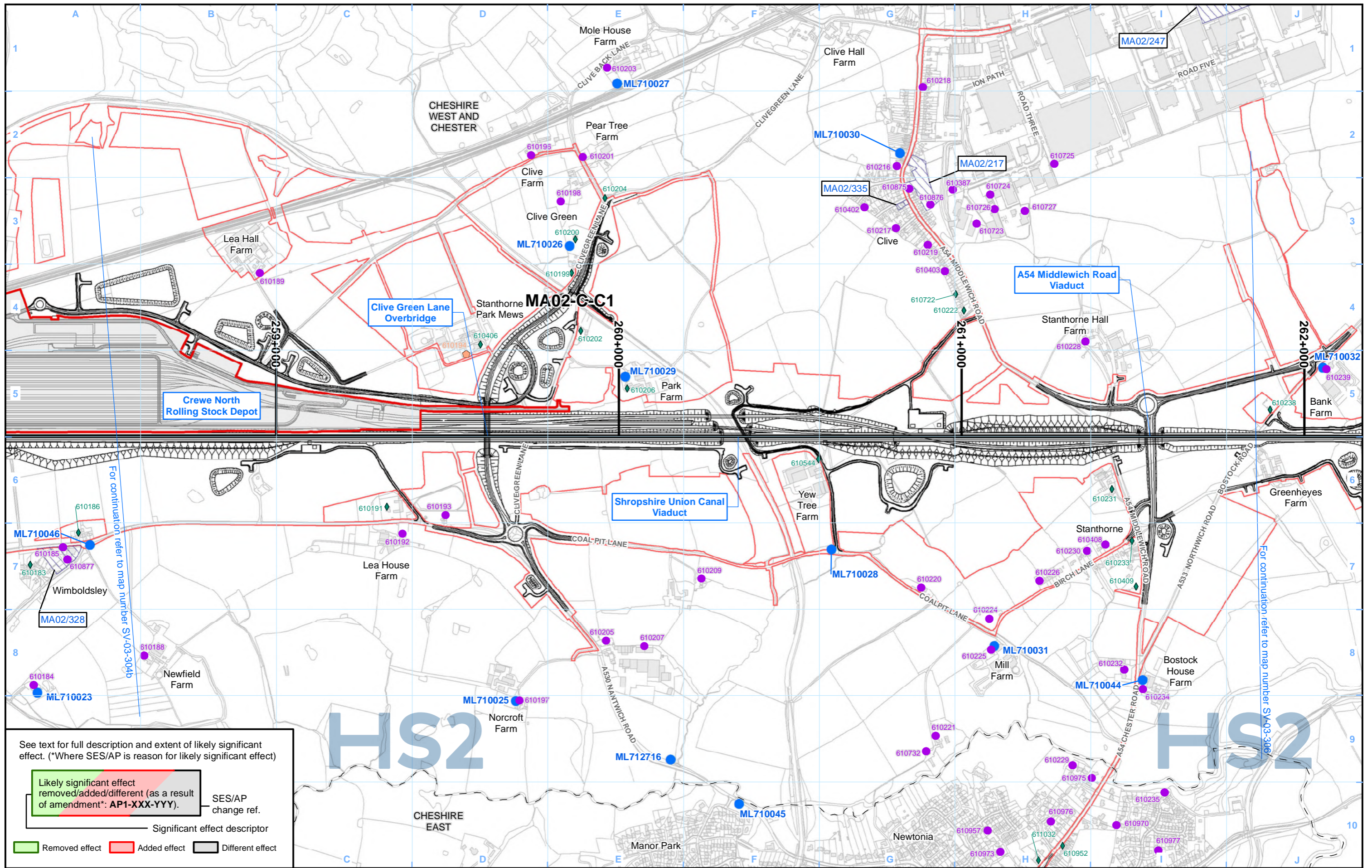
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See text for full description and extent of likely significant effect. (*Where SES/AP is reason for likely significant effect)

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
Significant effect descriptor	
Removed effect	Added effect
Different effect	

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

- Engineering earthworks:**
- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting
- Land potentially required during construction

- Legend - Sound related features**
- Committed developments - SV Only
 - Construction airborne sound assessment location
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number: SV-03-305

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

HS2

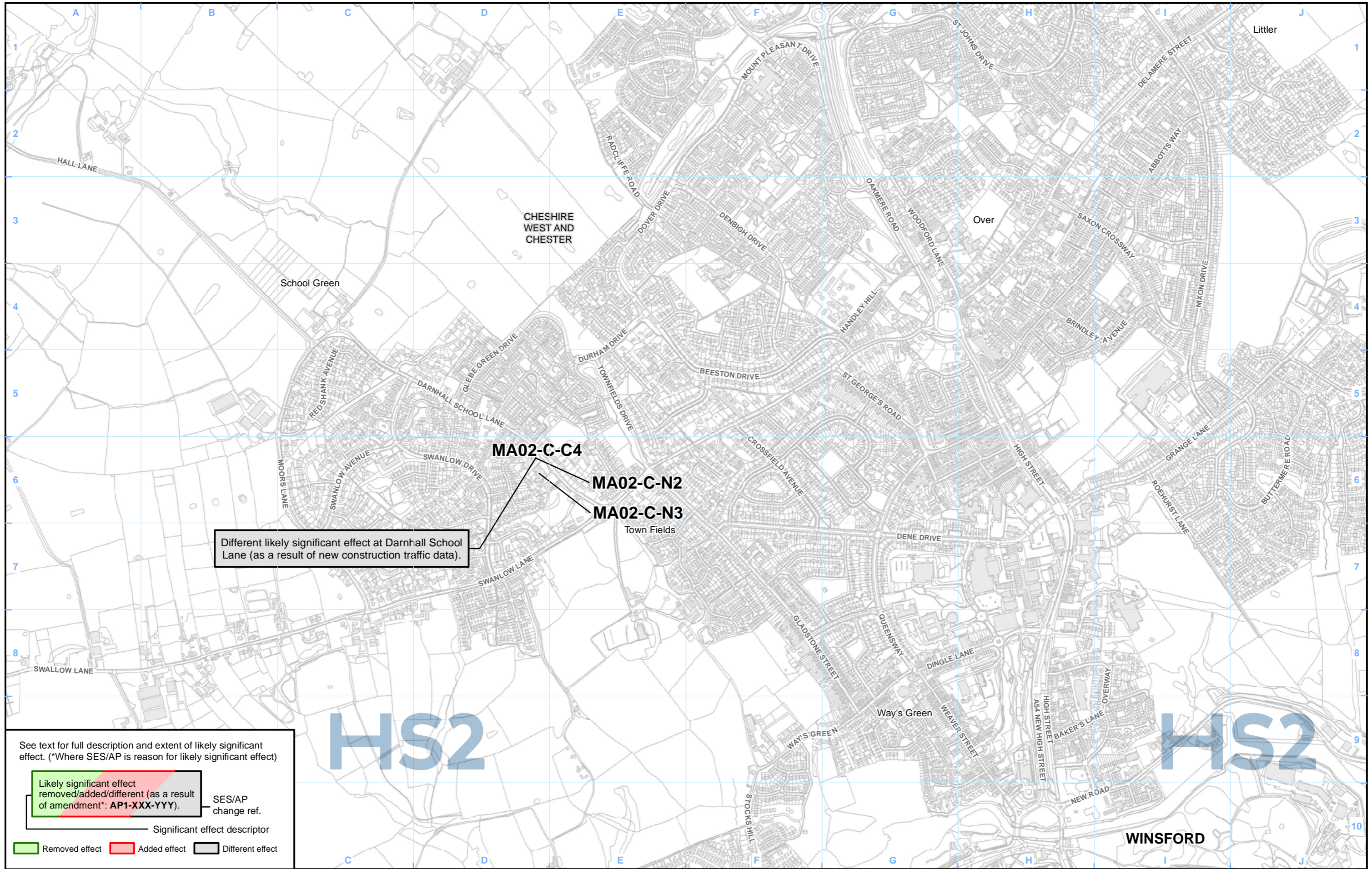
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Different likely significant effect at Darnhall School Lane (as a result of new construction traffic data).

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY). SES/AP change ref.

Significant effect descriptor

Removed effect Added effect Different effect

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary
- Engineering earthworks: Embankment, Cutting
- Non engineering earthworks: Embankment, Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
 - Construction airborne sound assessment location
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location
- labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).
- Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number SV-03-305-L1

Map Name Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

HS2

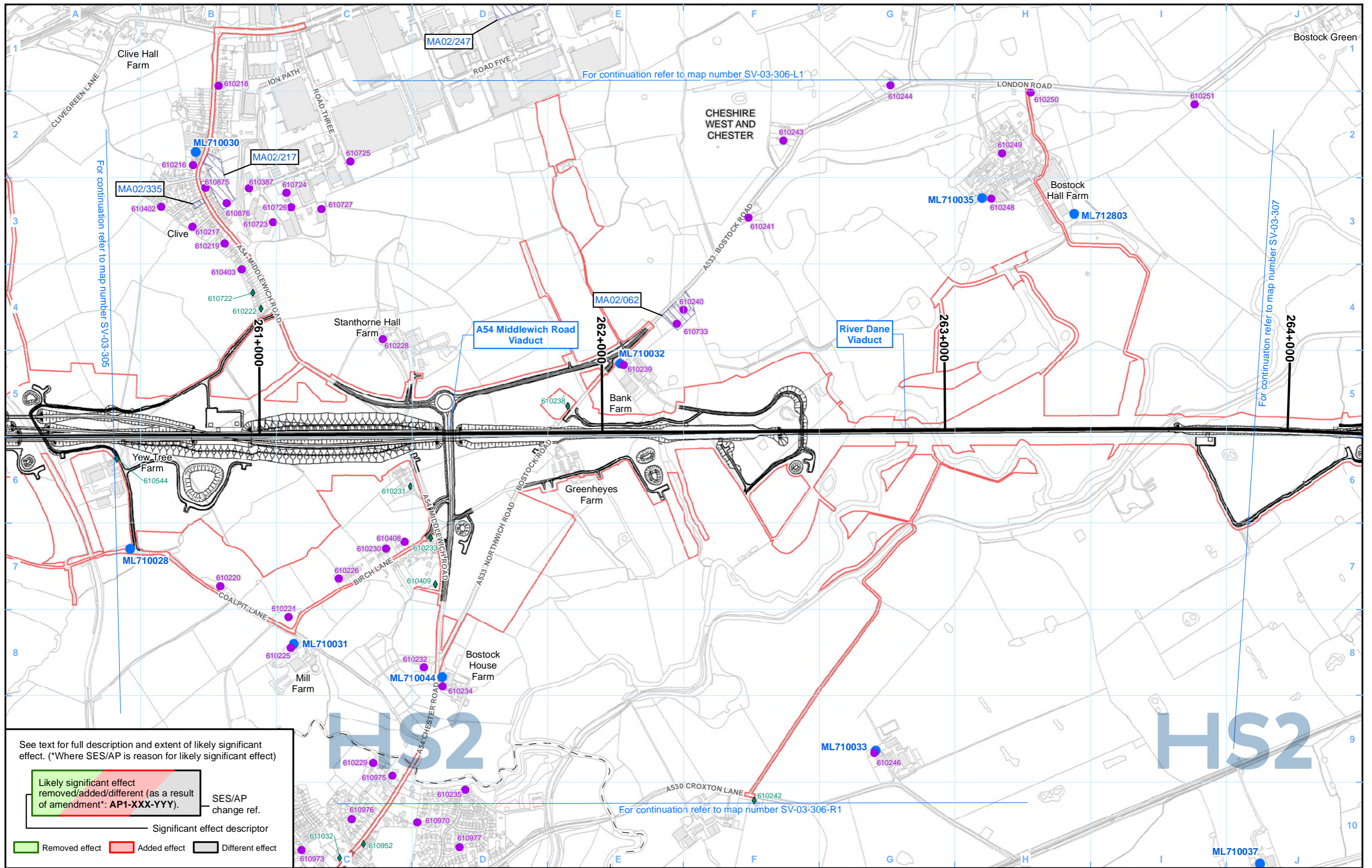
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Doc Number: 2DE01-MWJ-EV-MAP-M000-003937-P01

Date: 19/04/22

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
— Significant effect descriptor	
Removed effect	Added effect
Different effect	

Legend - General features

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

Engineering earthworks:

- Non engineering earthworks: Embankment, Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number: SV-03-306

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Grlam

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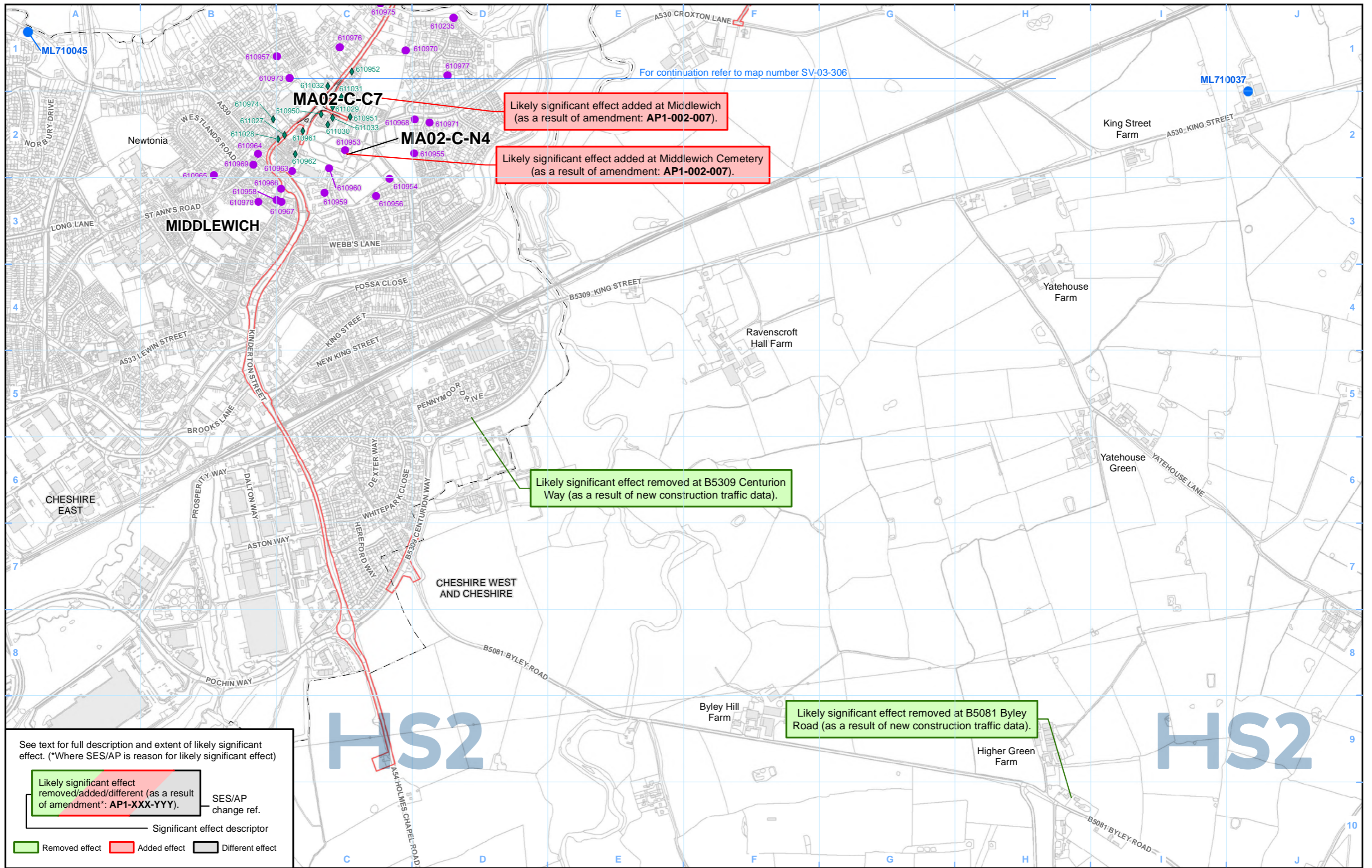
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Likely significant effect added at Middlewich (as a result of amendment: AP1-002-007).

Likely significant effect added at Middlewich Cemetery (as a result of amendment: AP1-002-007).

Likely significant effect removed at B5309 Centurion Way (as a result of new construction traffic data).

Likely significant effect removed at B5081 Byley Road (as a result of new construction traffic data).

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.	
—	Significant effect descriptor	
Removed effect	Added effect	Different effect

Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number: SV-03-306-R1

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

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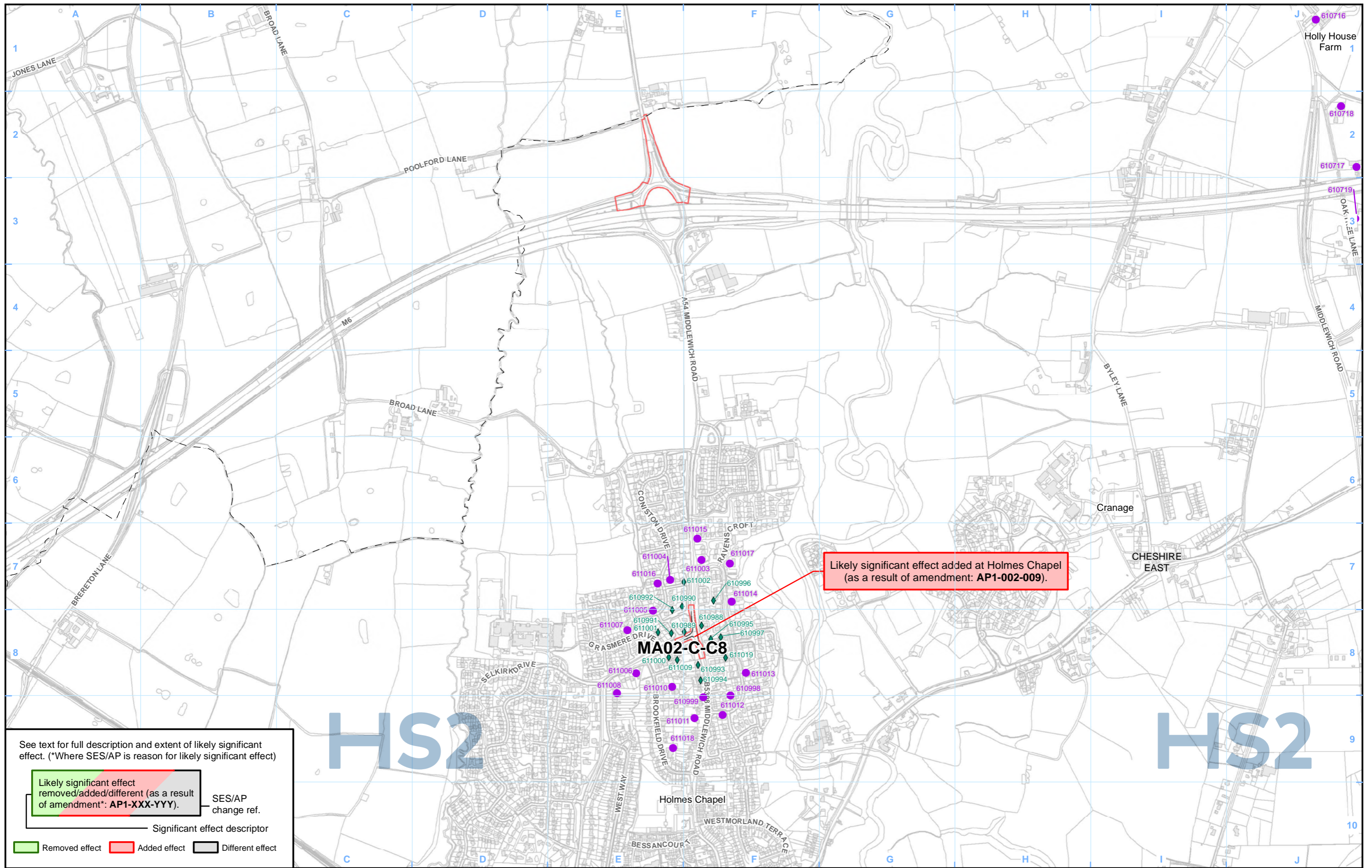
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See text for full description and extent of likely significant effect. (*Where SES/AP is reason for likely significant effect)

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.	
Significant effect descriptor		
Removed effect	Added effect	Different effect

HS2

HS2

Legend - General features

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

Engineering earthworks: Non engineering earthworks:

- Embankment
- Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number	SV-03-306-R2
Map Name	Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES
	Community Area MA02: Wimboldsley to Lostock Gralam

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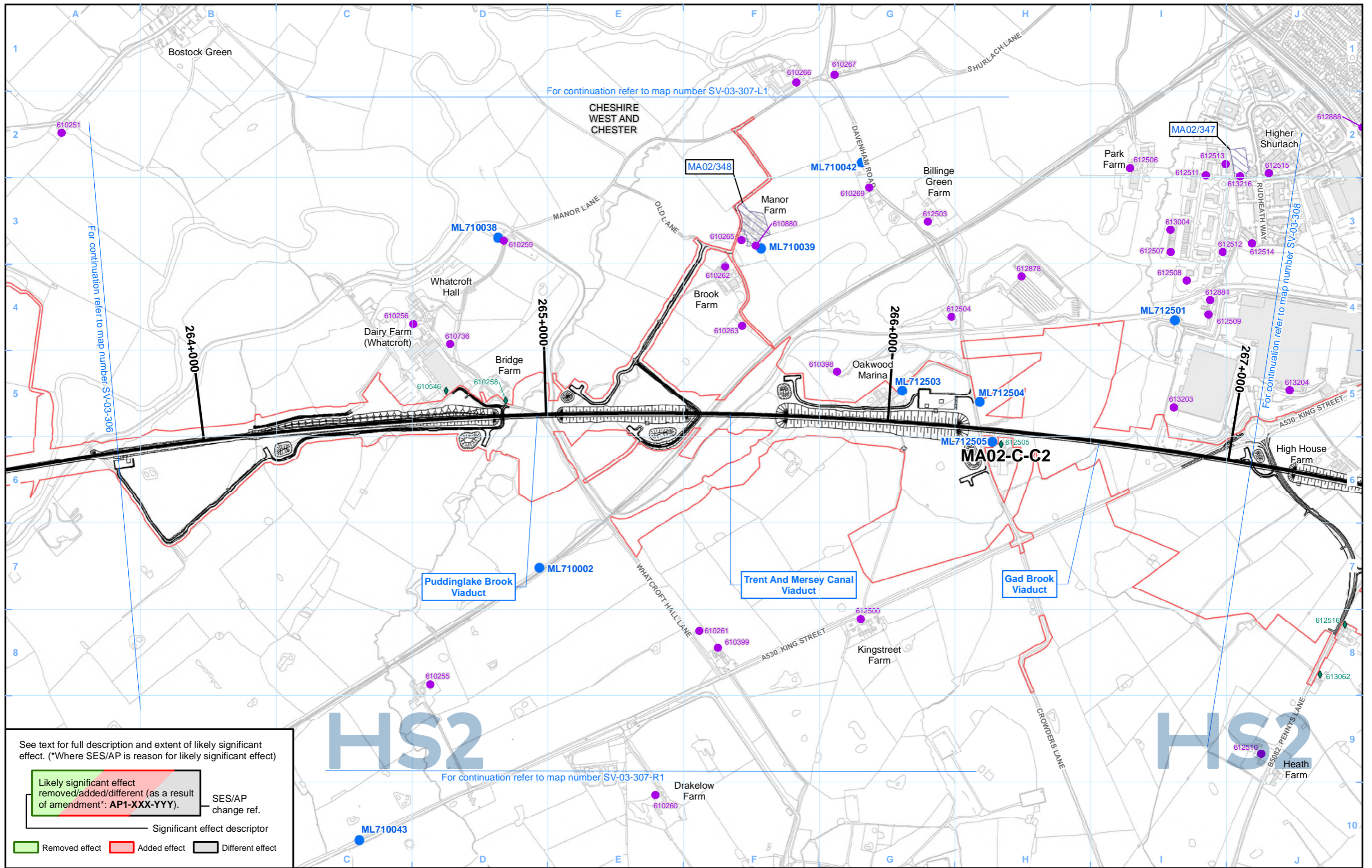
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See text for full description and extent of likely significant effect. (*Where SES/AP is reason for likely significant effect)

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
Significant effect descriptor	
Removed effect	Added effect
Different effect	

Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number: SV-03-307

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

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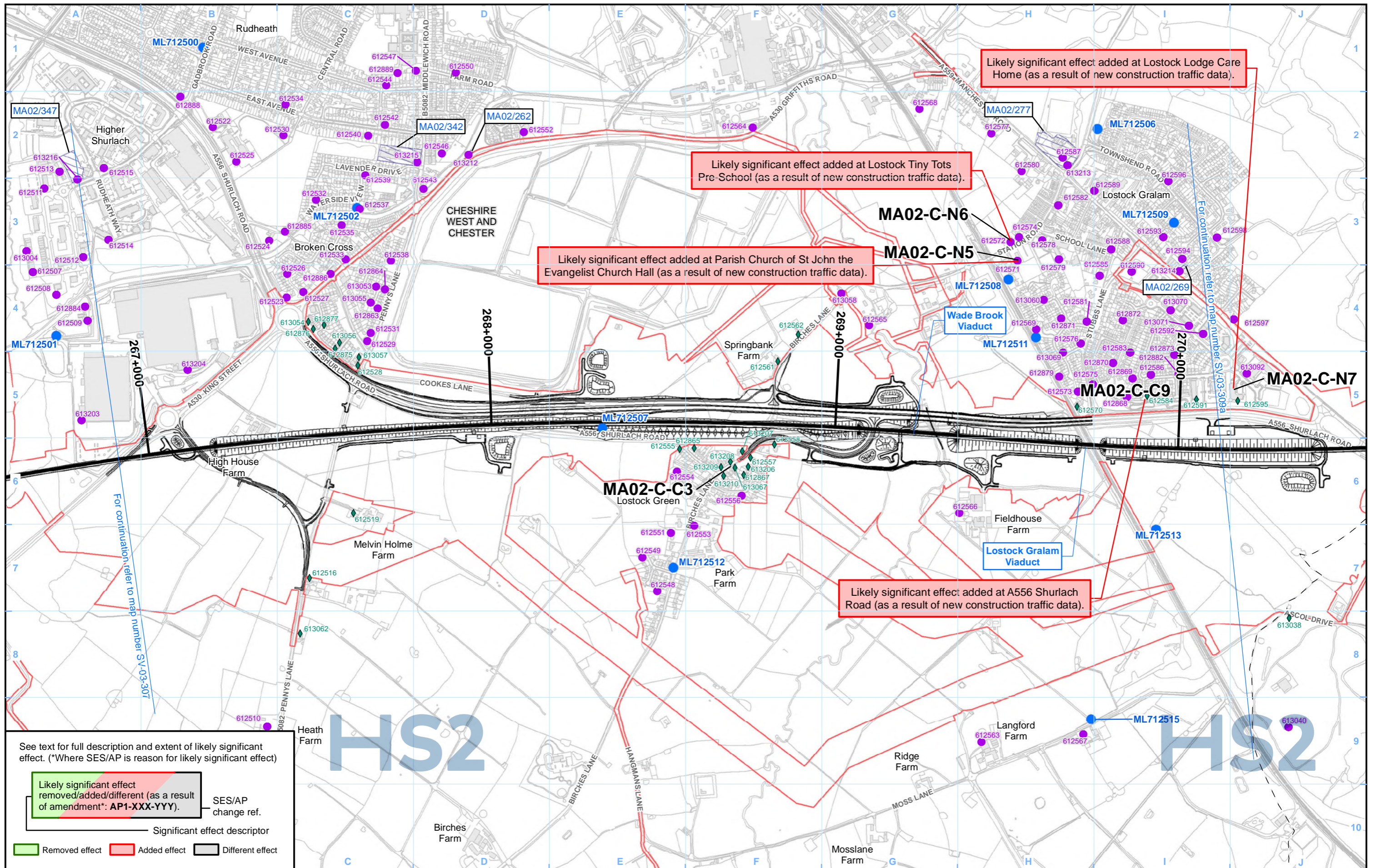
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See text for full description and extent of likely significant effect. (*Where SES/AP is reason for likely significant effect)

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.	
—	Significant effect descriptor	
Removed effect	Added effect	Different effect

Legend - General features

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

Legend - Sound related features

- Engineering earthworks:
 - Embankment
 - Cutting
- Non engineering earthworks:
 - Embankment
 - Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number	SV-03-308
Map Name	Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES
Community Area MA02: Wimboldsley to Lostock Gram	

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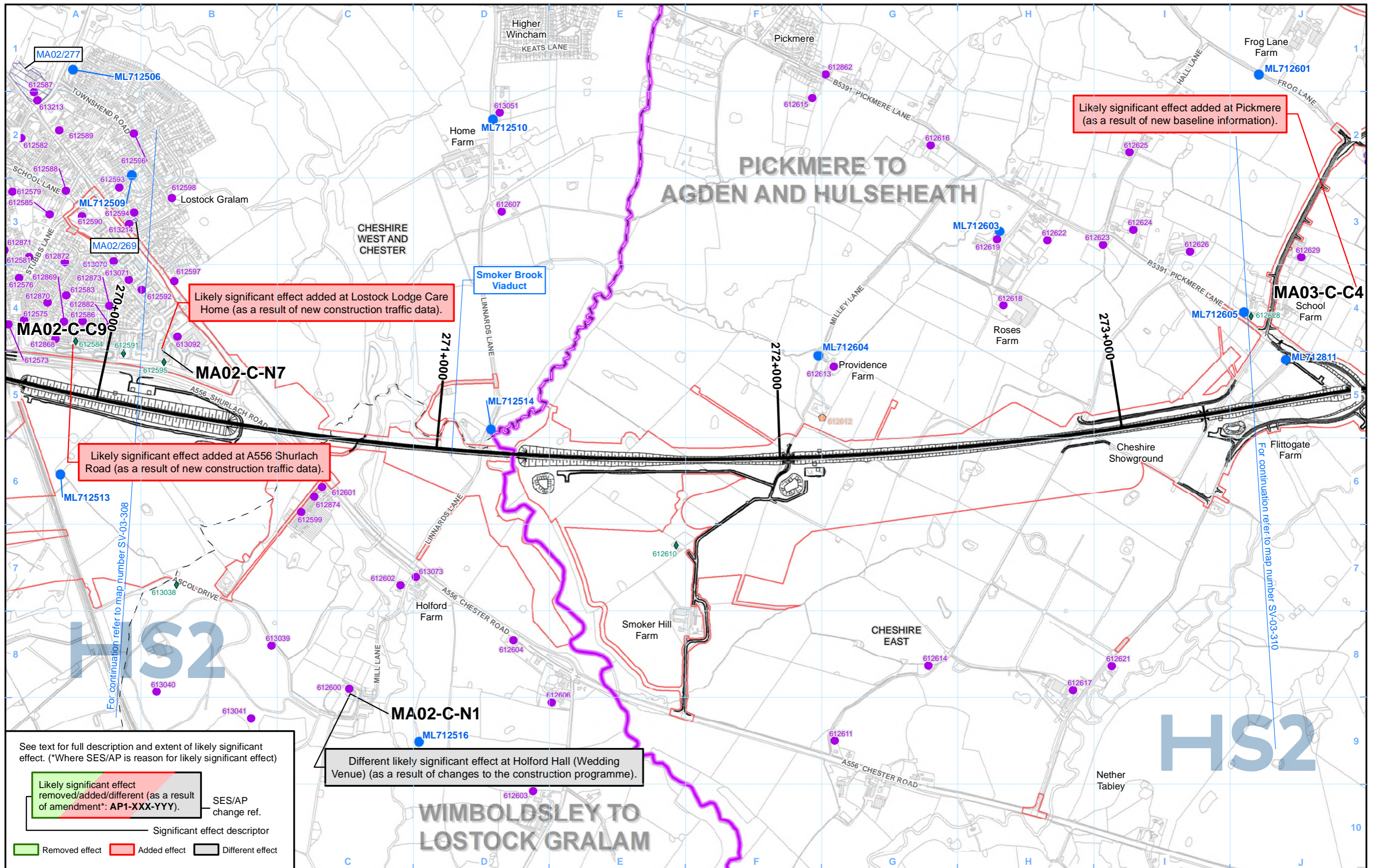
Doc Number: 2DE01-MWJ-EV-MAP-M000-002056-P01

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Date: 19/04/22

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Likely significant effect added at Pickmere (as a result of new baseline information).

Likely significant effect added at Lostock Lodge Care Home (as a result of new construction traffic data).

Likely significant effect added at A556 Shurlach Road (as a result of new construction traffic data).

Different likely significant effect at Holford Hall (Wedding Venue) (as a result of changes to the construction programme).

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
Significant effect descriptor	
Removed effect	Added effect
Different effect	

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary
- Engineering earthworks:
 - Embankment
 - Cutting
- Non engineering earthworks:
 - Embankment
 - Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
 - Construction airborne sound assessment location (labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location
- Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA02-C-C# and MA02-C-N#, respectively.

Map Number: SV-03-309a

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

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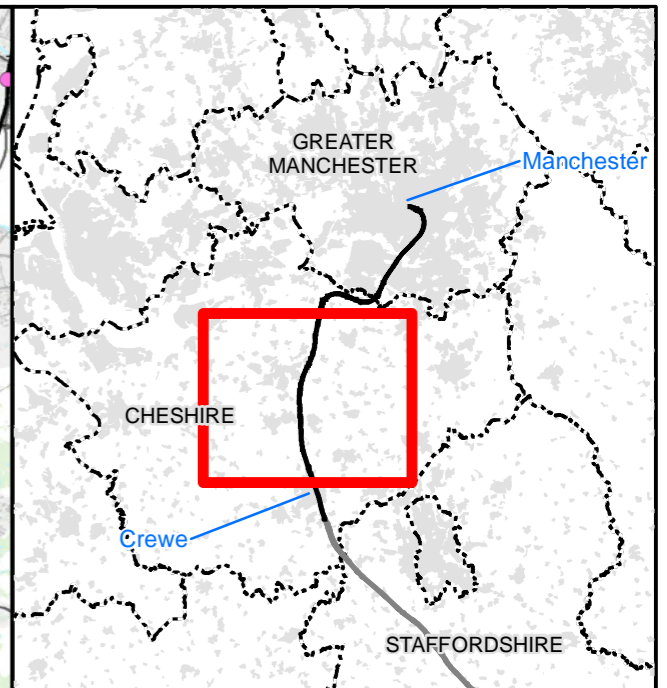
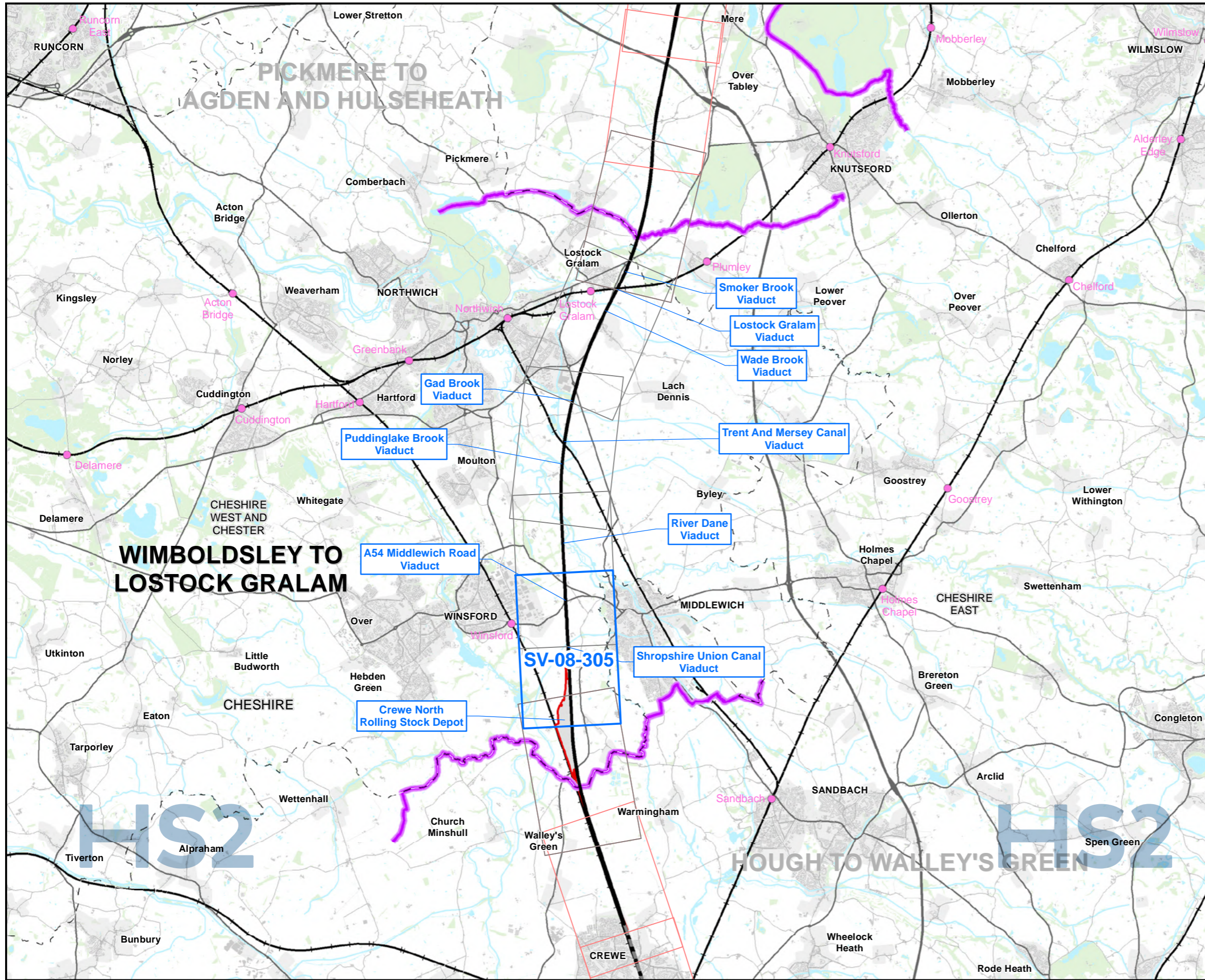
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Date: 19/04/22



Map Series Information:

SV-08 presents the predicted daytime operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{p,Aeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; this panel contains a key communicating the daytime sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-09, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-08 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;
- 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.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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 area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

Map Number	SV-08-INDEX-MA02
Map Name	Index Map of: Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA02: Wimboldsley to Lostock Gralam

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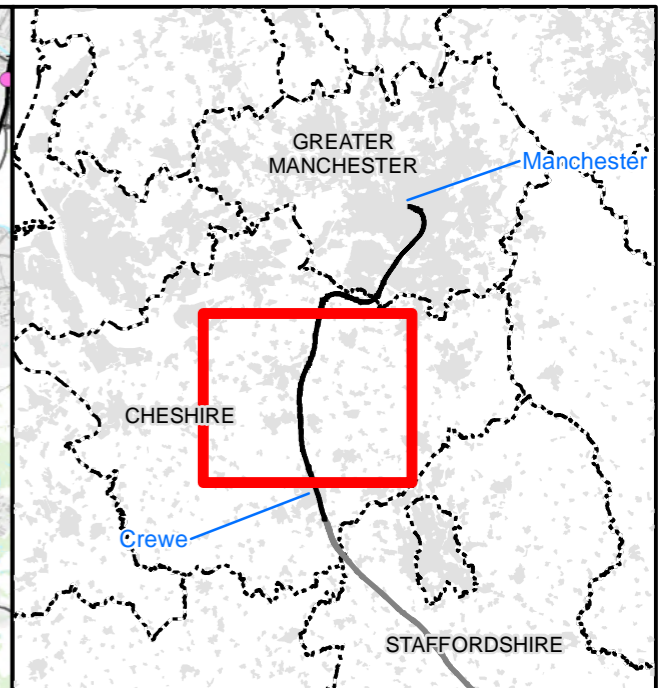
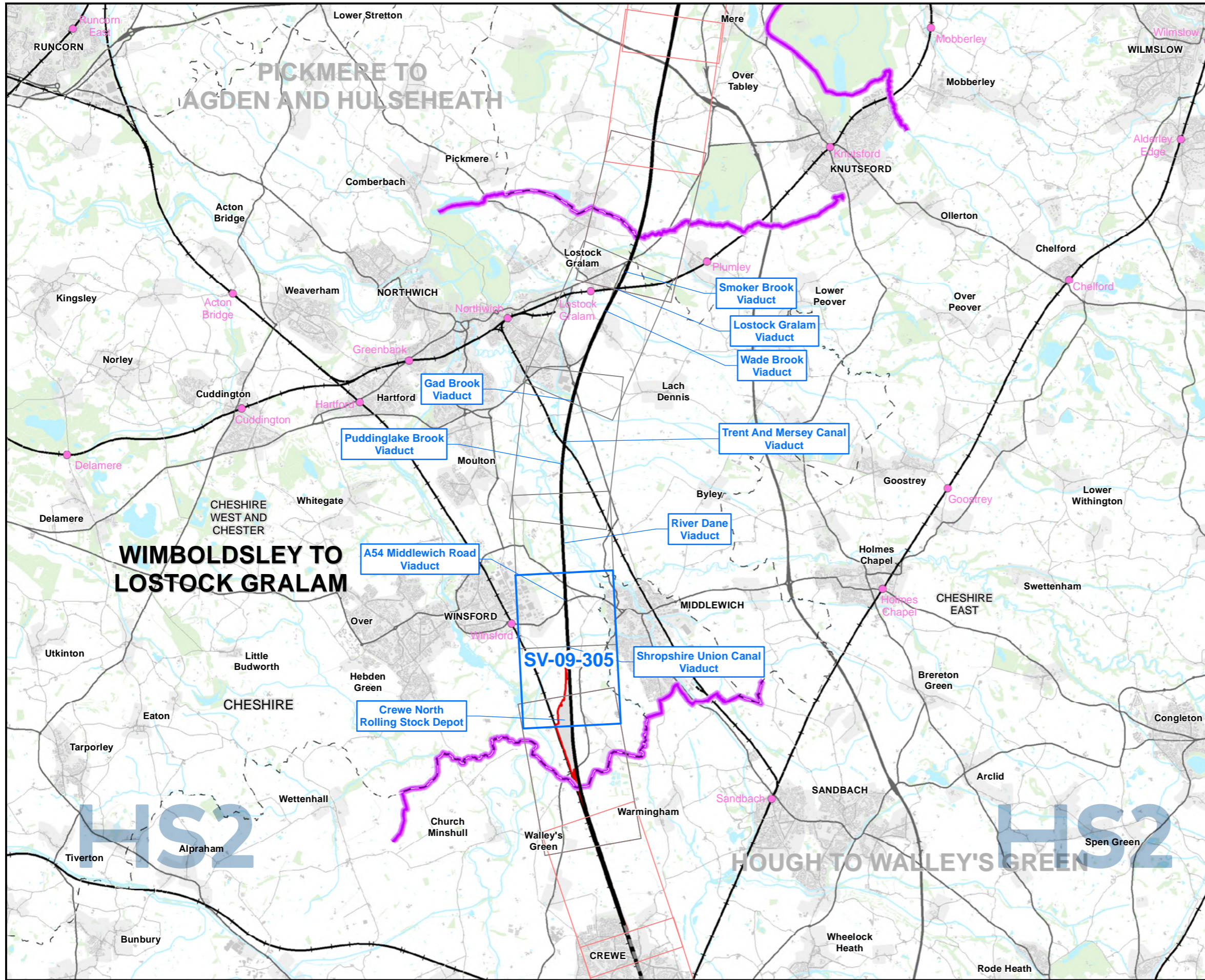
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Doc Number: 2PT24-MWJ-EV-MAP-M000-003073-P01

Date: 19/04/22



Map Series Information:

SV-09 presents the predicted night-time operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{p,Aeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; this panel contains a key communicating the night-time sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-08, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-09 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;
- 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.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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

Map Number	SV-09-INDEX-MA02
Map Name	Index Map of: Night-time Operational Sound Contour Maps SES1 and AP1 ES Community Area MA02: Wimboldsley to Lostock Gralam

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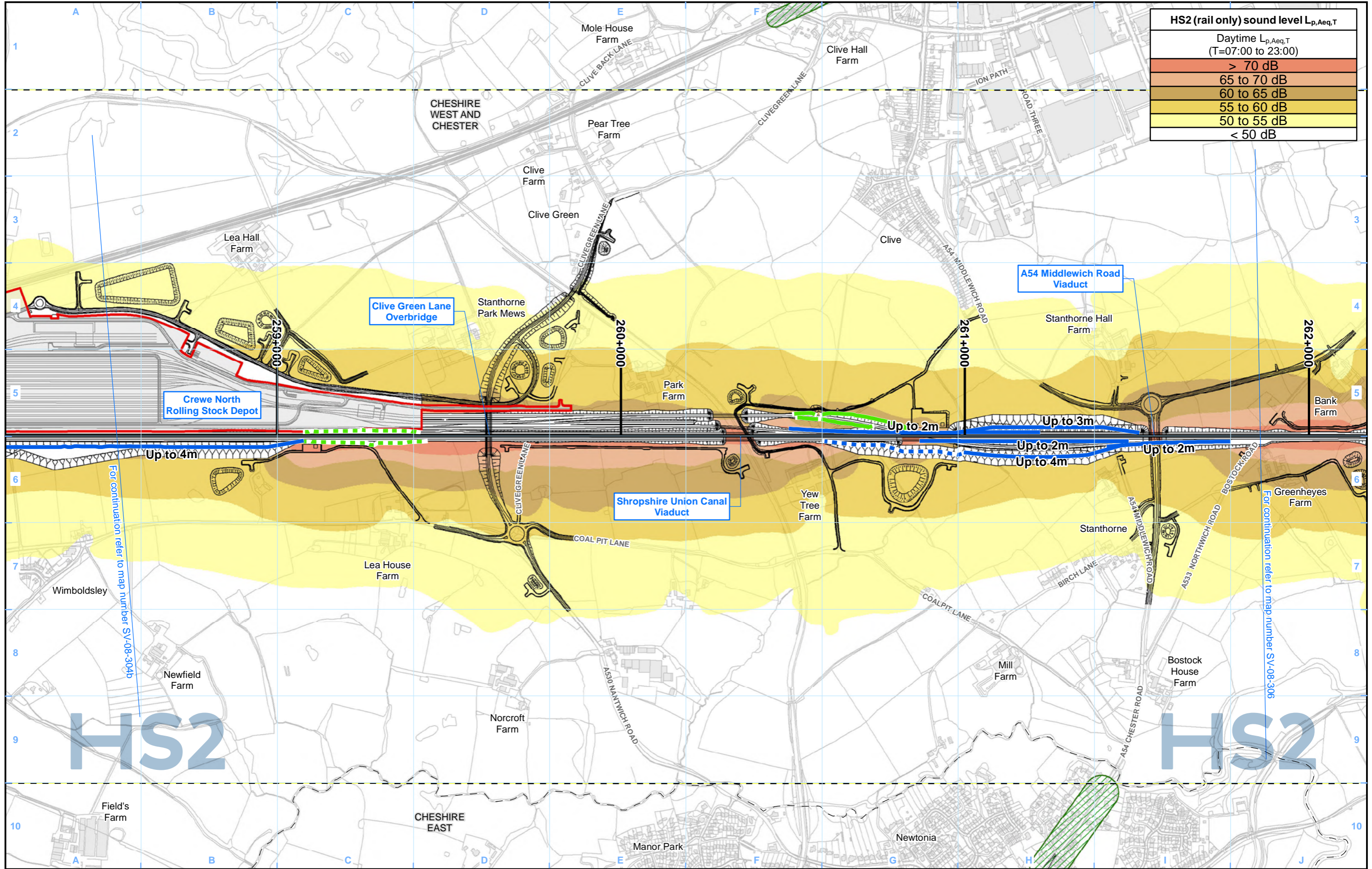
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Doc Number: 2PT24-MWJ-EV-MAP-M000-003114-P01 **Date:** 19/04/22

HS2 (rail only) sound level L _{p,Aeq,T}	
Daytime L _{p,Aeq,T} (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	50 to 55 dB
	< 50 dB



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

* Labelled with total barrier height above rail level

Map Number	SV-08-305
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES
	Community Area MA02: Wimboldsley to Lostock Gralam

HS2

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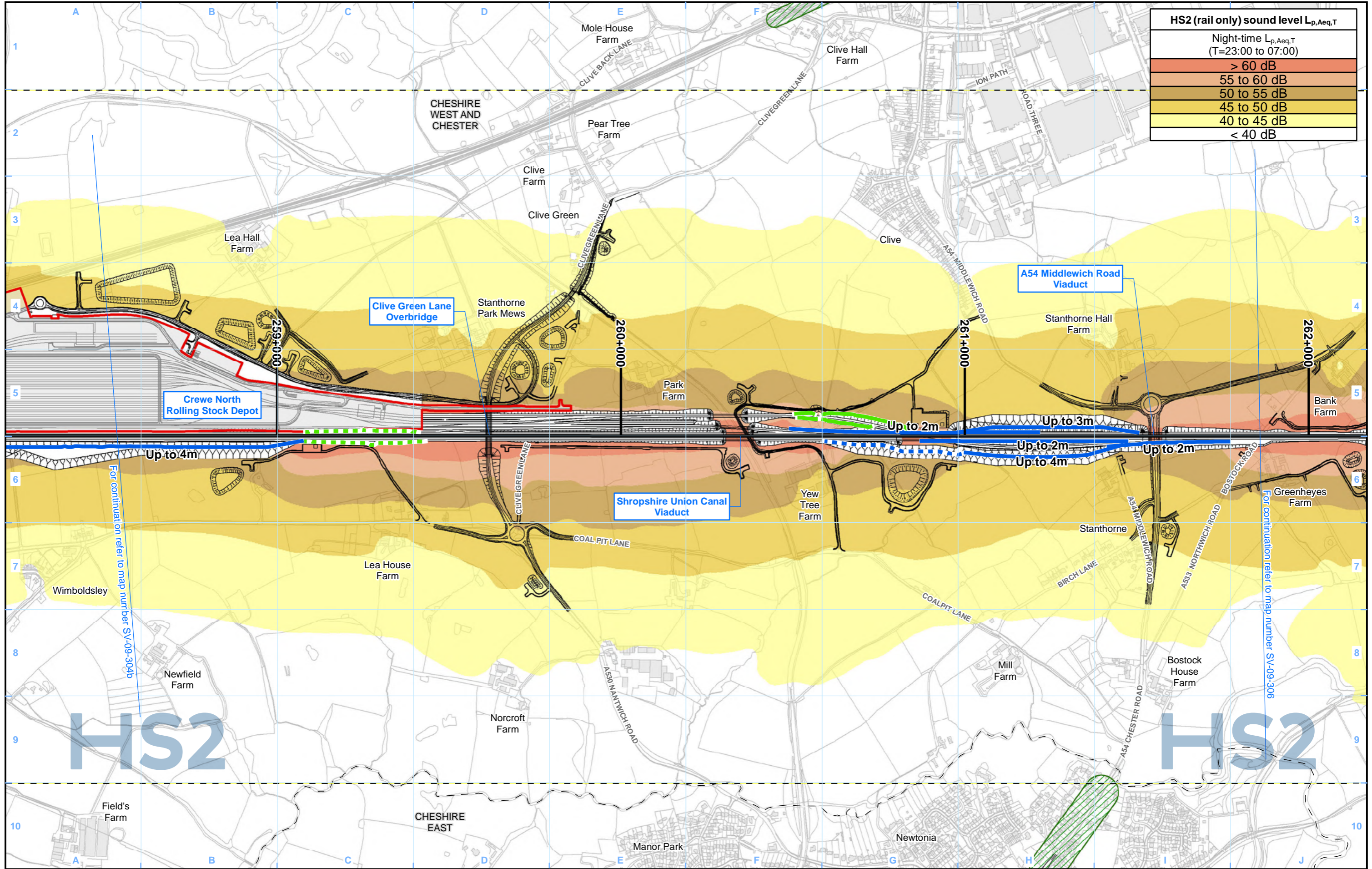
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Doc Number: 2PT24-MWJ-EV-MAP-M000-003085-P01

Date: 19/04/22

HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
> 60 dB	(Dark red)
55 to 60 dB	(Red)
50 to 55 dB	(Orange)
45 to 50 dB	(Yellow)
< 40 dB	(Light yellow)



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

* Labelled with total barrier height above rail level

Map Number: SV-09-305

Map Name: Night-time Operational Sound Contour Maps SES1 and AP1 ES

Community Area MA02: Wimboldsley to Lostock Gralam

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Doc Number: 2PT24-MWJ-EV-MAP-M000-003126-P01

Date: 19/04/22

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High Speed Rail (Crewe – Manchester)

Supplementary Environmental Statement 1 and Additional Provision 1 Environmental Statement

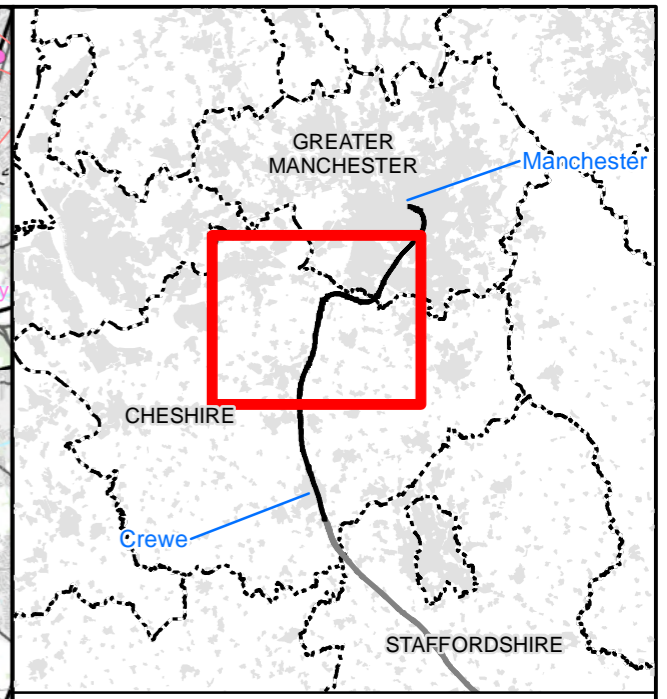
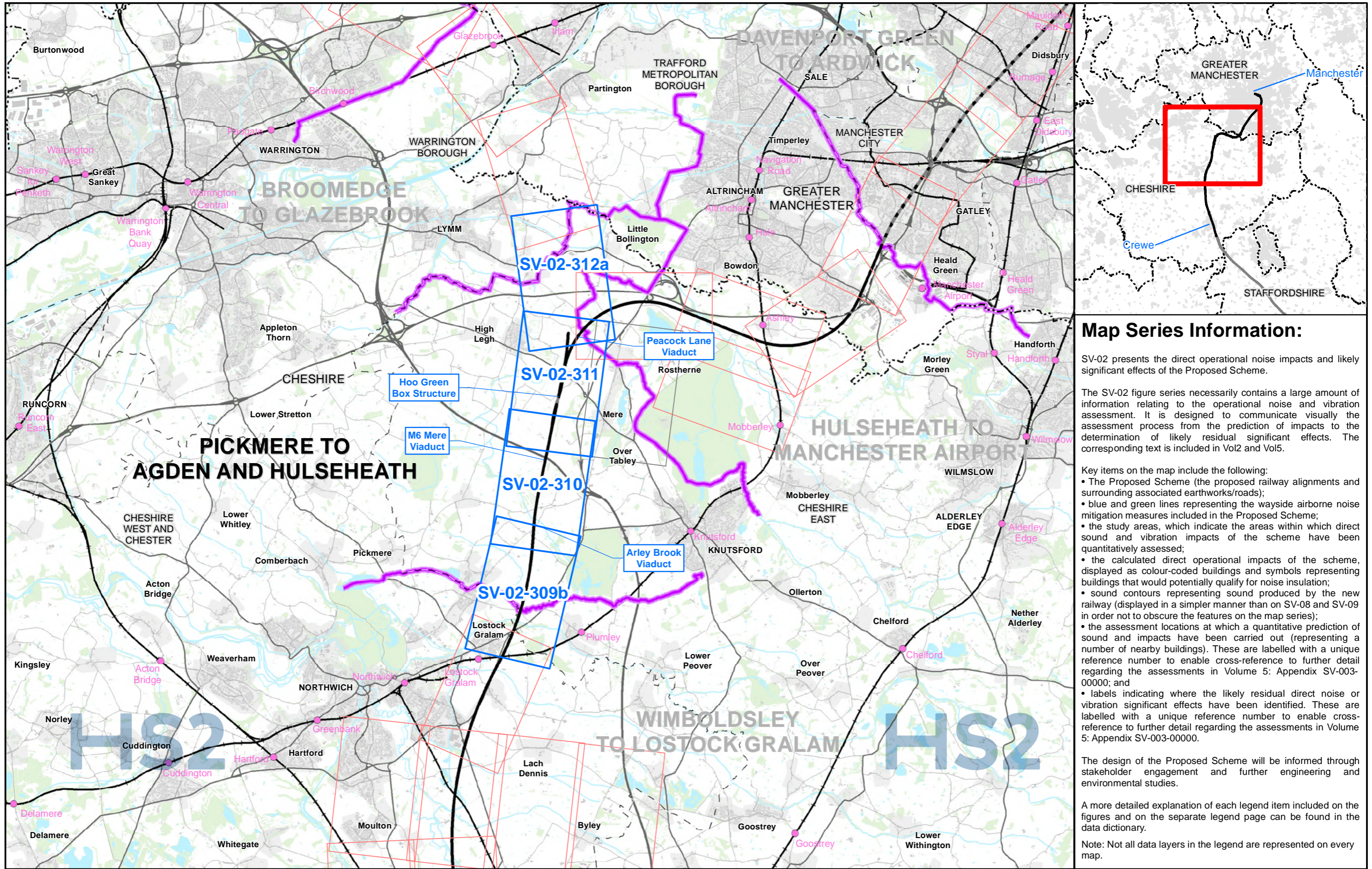
MA03: Pickmere to Agden and Hulseheath

SV-02 – Operational Airborne Noise and Vibration Impacts and
Likely Significant Effects

SV-03 – Construction Airborne Noise and Vibration
Likely Significant Effects

SV-08 – Day-time Operational Sound Contour Maps

SV-09 – Night-time Operational Sound Contour Maps



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-08 and SV-09 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-003-00000; 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-003-00000.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

A more detailed explanation of each legend item included on the figures and on the separate legend page 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 area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

Map Number	SV-02-INDEX-MA03
Map Name	Index Map of: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES Community Area MA03: Pickmere to Agden and Hulseheath

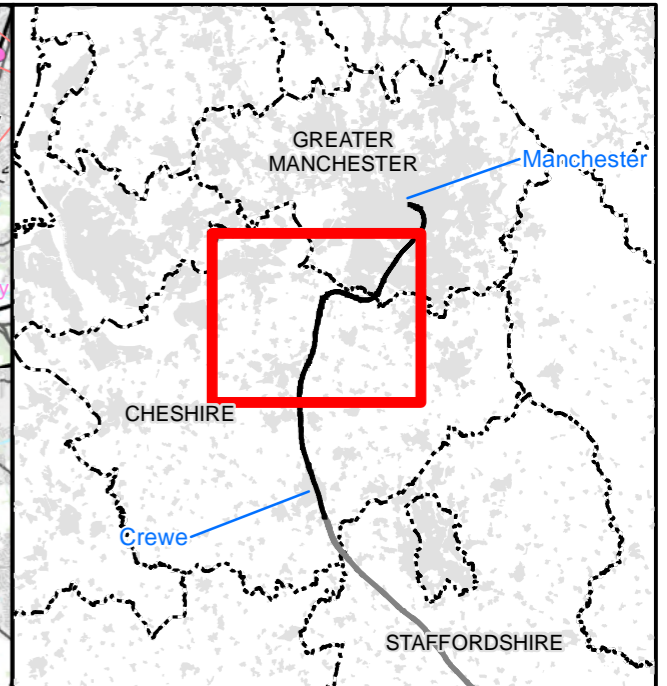
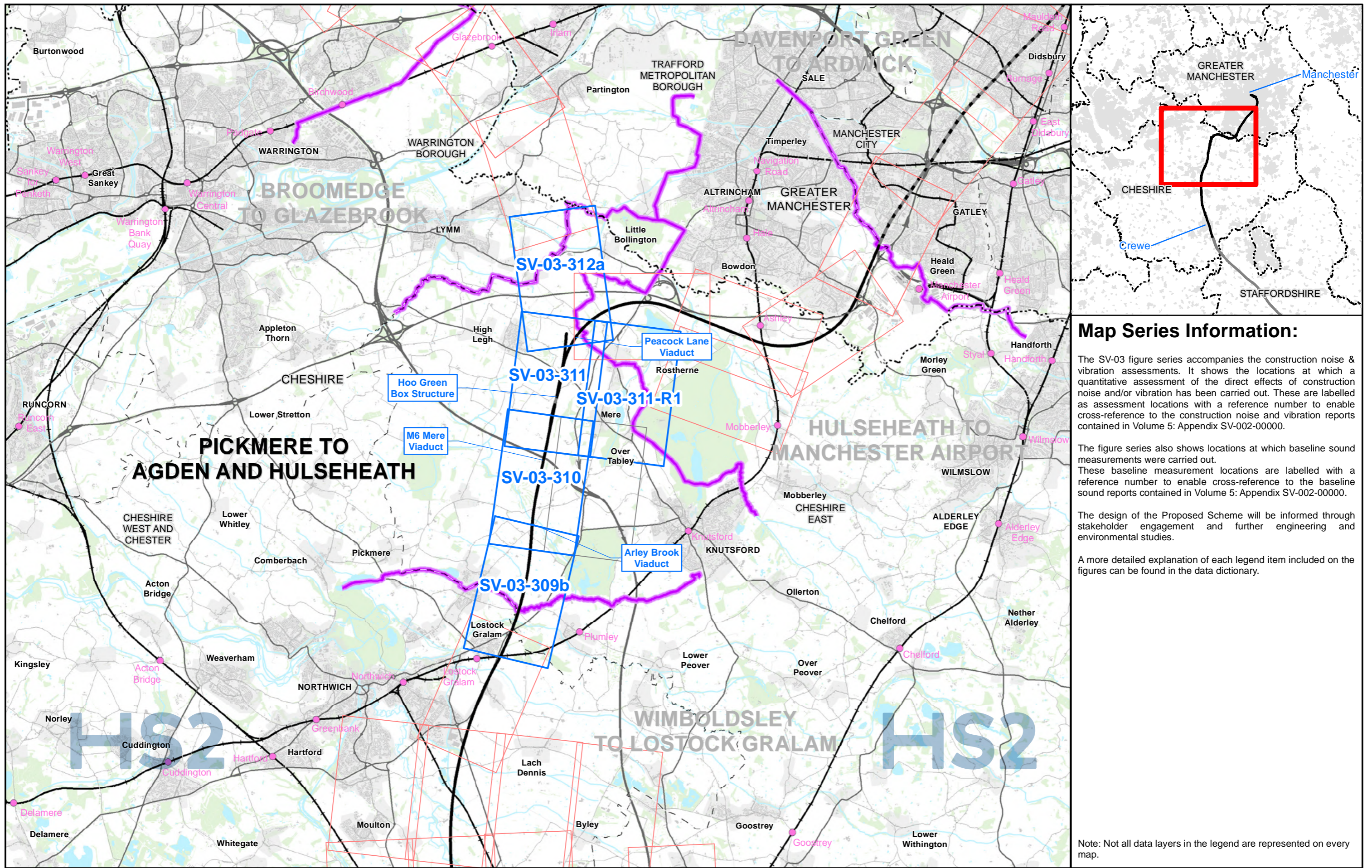
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Map Series Information:

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-002-00000.

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-002-00000.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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 area boundary
- Existing railway station
- County boundary
- District/Borough boundary
- Map sheets included in this community area
- Map sheets included in this community area with no amendment
- Map sheets not included in this community area

Map Number	SV-03-INDEX-MA03
Map Name	Index Map of: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES Community Area MA03: Pickmere to Agden and Hulseheath

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Doc Number: 2PT24-MWJ-EV-MAP-M000-002085-P01 Date: 19/04/22

HS2 (rail only) noise level $L_{p,Aeq,T}$		Potential noise effect ^{1, 2}	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	Daytime $L_{p,Aeq,T}$ (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 SV-003-00000. Likely significant effect indicated by MA0X-O-N# ²
40 to 55 dB	50 to 65 dB	Effect dependent on noise level change and significance criteria. Likely significant effects on groups of dwellings and any shared community open areas indicated by MA0X-O-C# ²	
< 40 dB	< 50 dB	Generally no adverse effect expected ¹	

Operational airborne noise impacts at residential buildings¹

-  Major adverse
-  Moderate adverse
-  Minor adverse
-  Negligible
-  Beneficial




-  Potential additional noise insulation (triggered by maximum noise 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
-  L_{pAFmax} exceeds 60dB façade
HS2 train only L_{pAFmax} +2.5dB façade correction

 Ground-borne noise or vibration impact at residential buildings

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY). SES/AP change ref.

Significant effect descriptor

 Removed effect  Added effect  Different effect

¹ For further information see Volume 5 Appendix SV-001-00000

² For further details of the SES/AP1 ES assessment see Volume 5 Appendix SV-003-00000

Map Number SV-02 - Legend

Map Name
Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES



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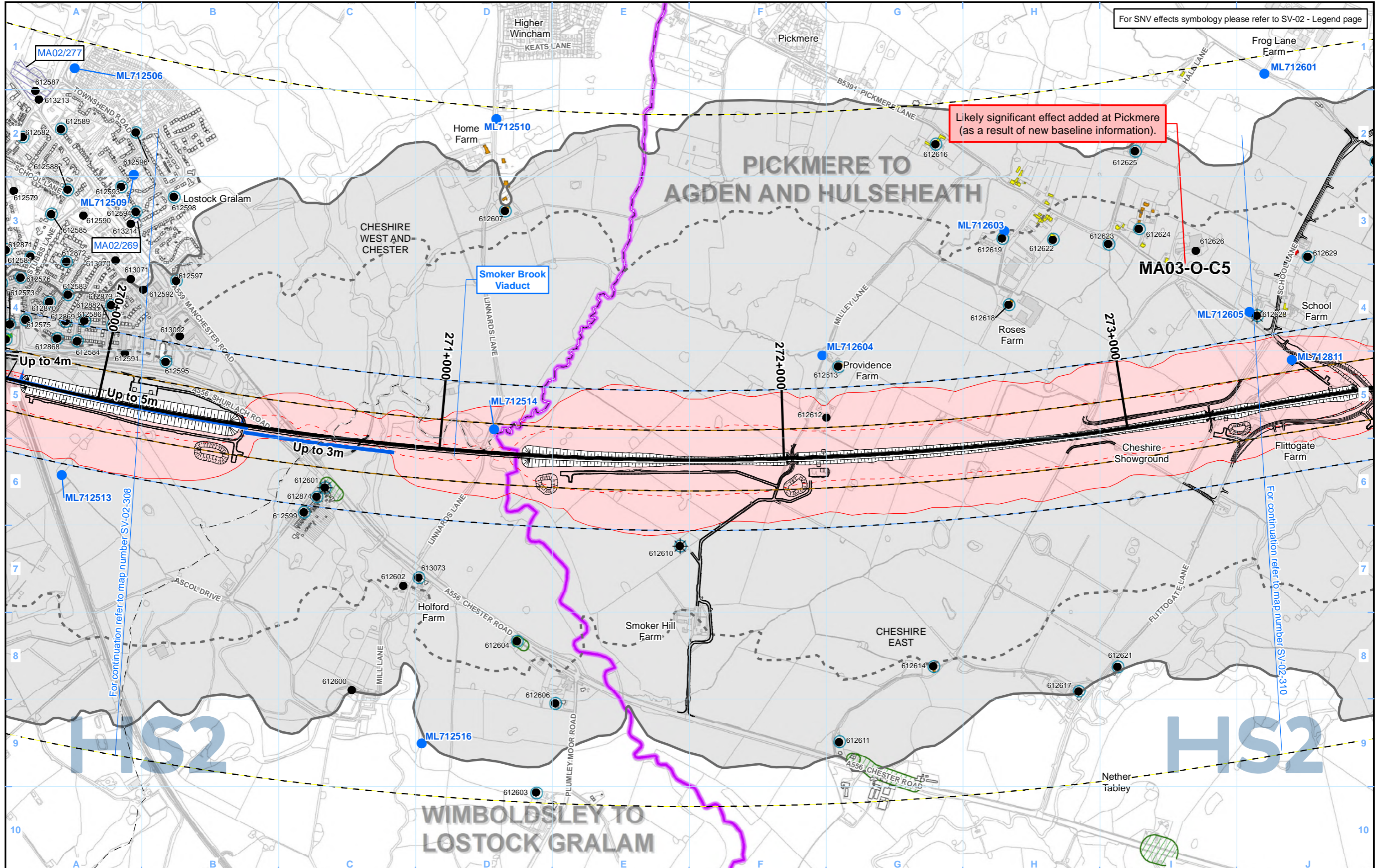
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For SNV effects symbology please refer to SV-02 - Legend page

Likely significant effect added at Pickmere (as a result of new baseline information).

Legend - General features

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

Engineering earthworks:

- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting

Legend - Noise related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings

Legend - Noise related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Noise Important Areas defined in national noise action plans (Defra 2014)
 - Committed developments - SV Only
 - Airborne noise study area

Legend - Noise related features

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-02-309b

Map Name

Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA03:
Pickmere to Agden and Hulseheath

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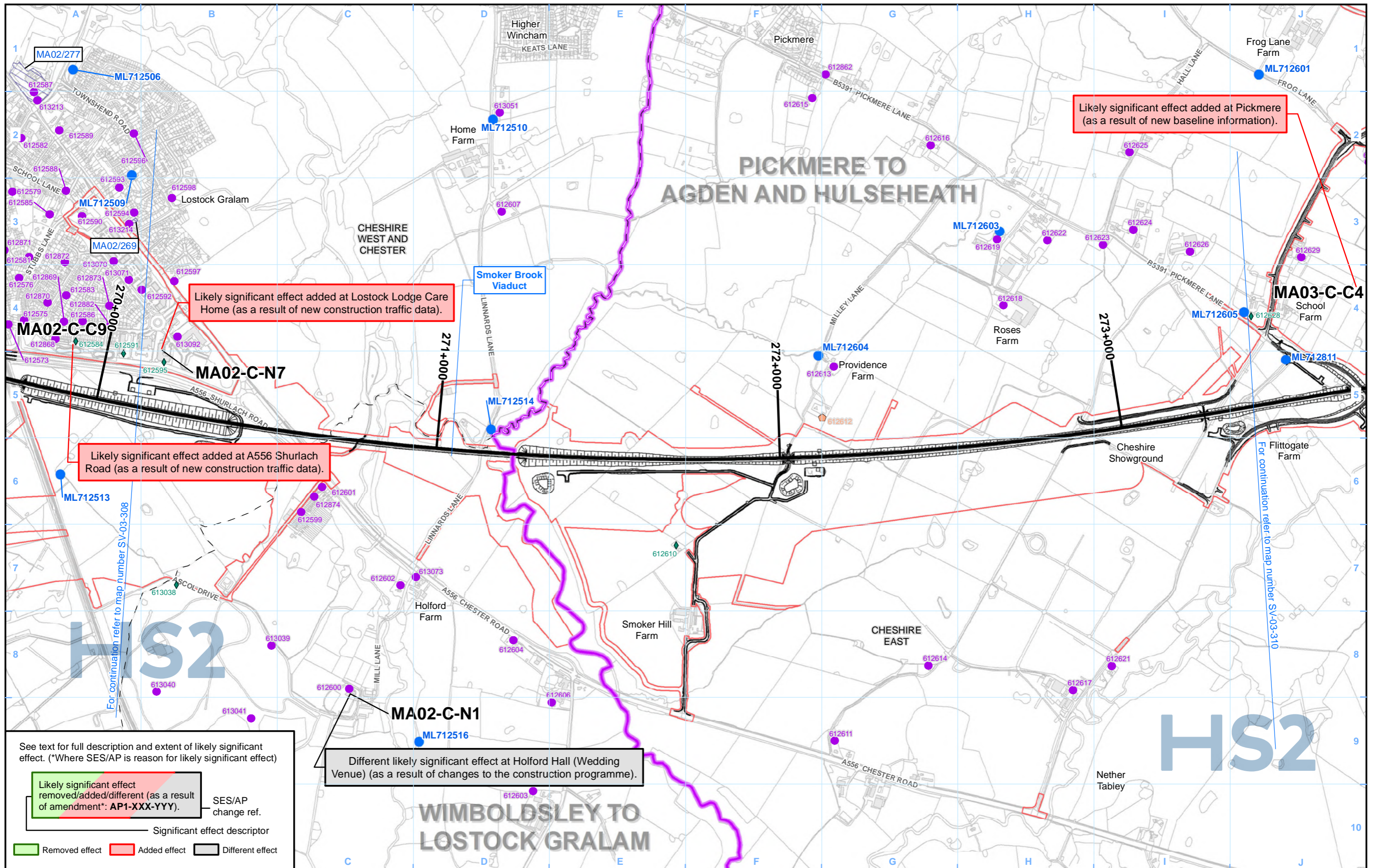
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Date: 19/04/22

For continuation refer to map number SV-02-308

For continuation refer to map number SV-02-310



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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
Significant effect descriptor	
Removed effect	Added effect
Added effect	Different effect

Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough boundary
- Engineering earthworks:
 - Embankment
 - Cutting
- Non engineering earthworks:
 - Embankment
 - Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
 - Construction airborne sound assessment location
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location
- labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).
- Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA03-C-C# and MA03-C-N#, respectively.

Map Number	SV-03-309b
Map Name	Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES
	Community Area MA03: Pickmere to Agden and Hulseheath

HS2

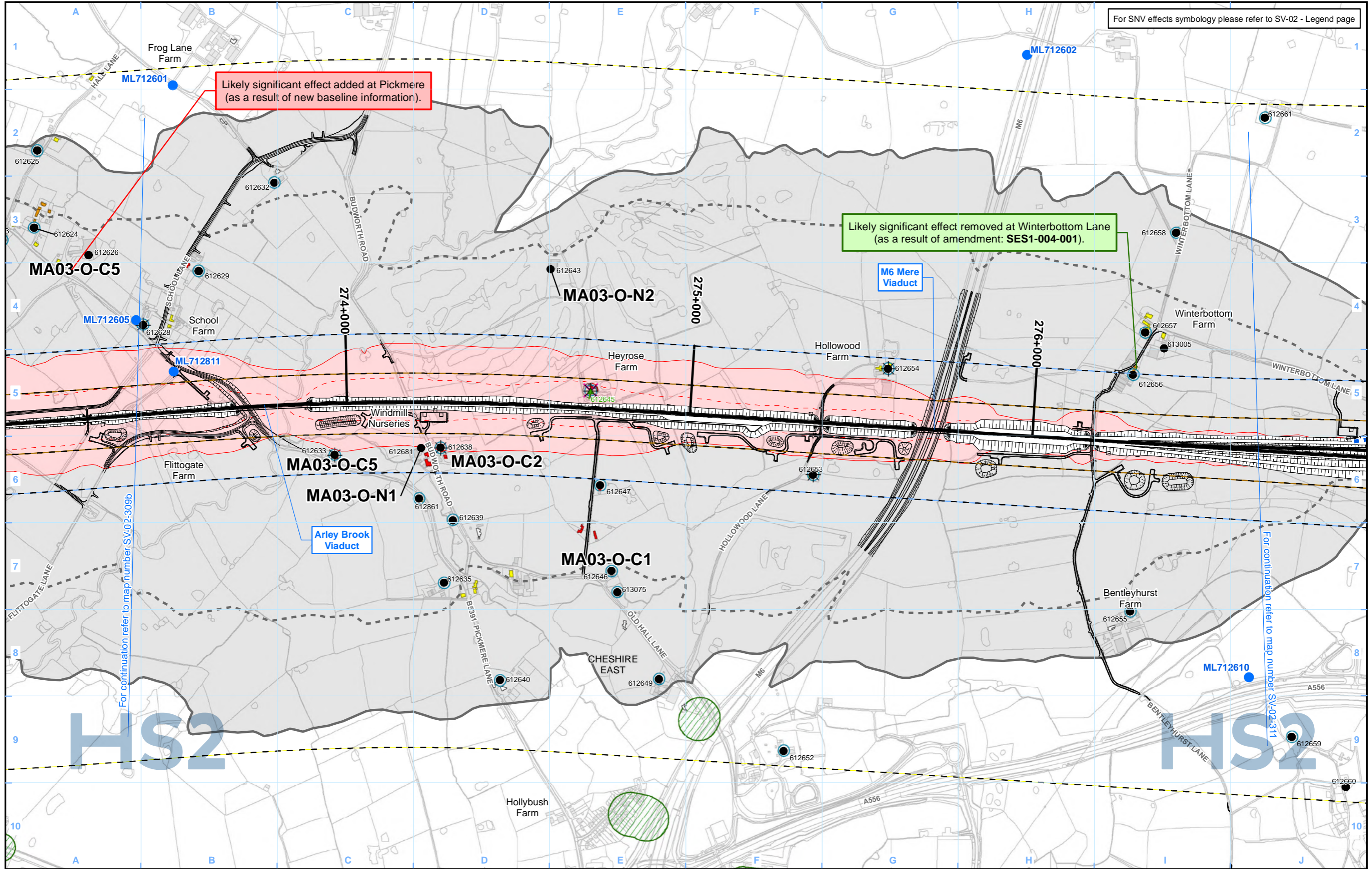
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Date: 19/04/22



Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Legend - Noise related features

Envisaged mitigation to avoid / reduce significant noise effects:

- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
- Engineering e.g. cuttings (green tunnels separately marked)

Envisaged features further reducing noise effects:

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

Noise Important Areas defined in national noise action plans (Defra 2014)

- Committed developments - SV Only
- Airborne noise study area

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number: SV-02-310

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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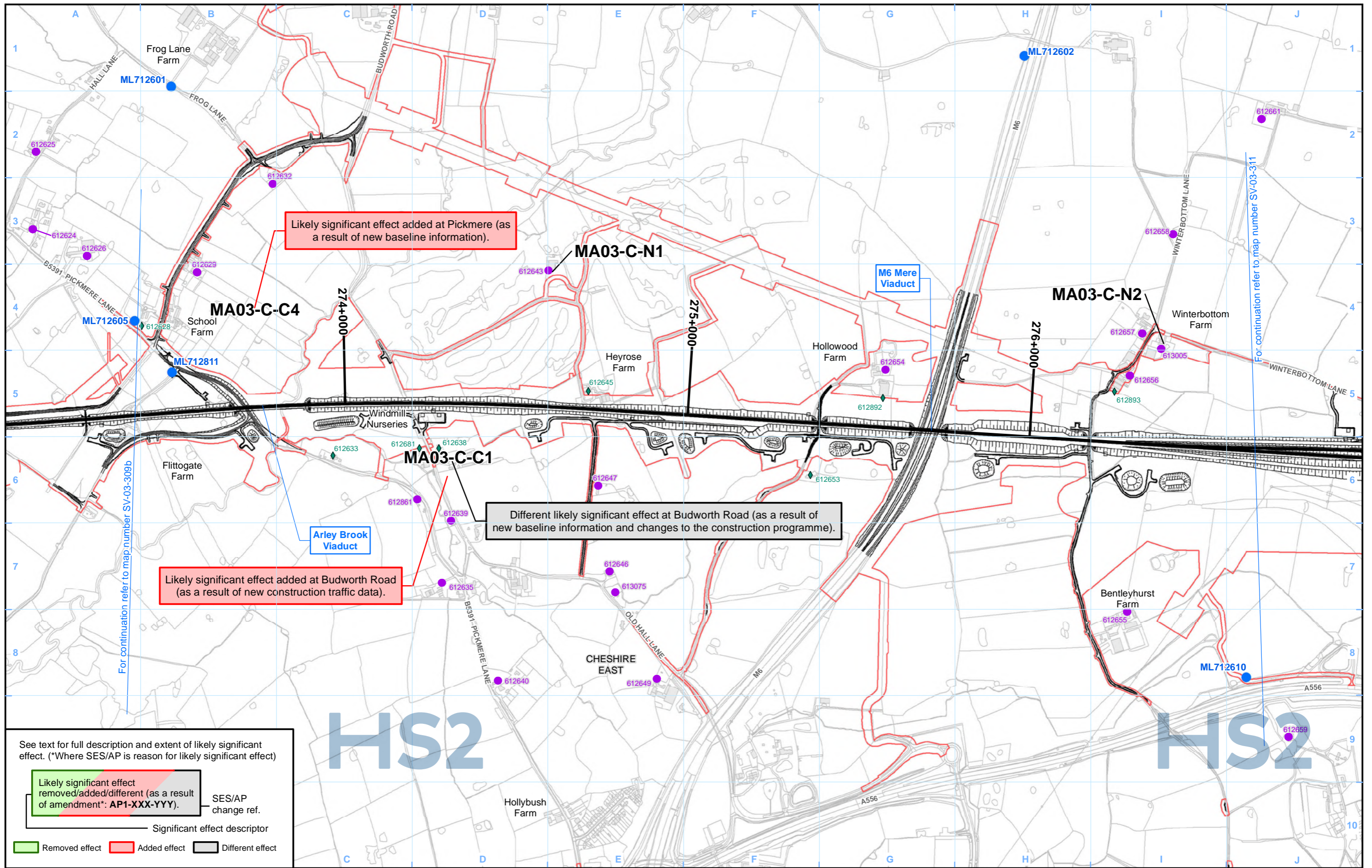
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See text for full description and extent of likely significant effect. (*Where SES/AP is reason for likely significant effect)

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
—	Significant effect descriptor
Removed effect	Added effect
Added effect	Different effect

Legend - General features

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

Engineering earthworks:

- Embankment
- Cutting

Non engineering earthworks:

- Embankment
- Cutting

Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
- Construction airborne sound assessment location
- Construction vibration assessment location
- Construction airborne sound and vibration assessment location
- Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA03-C-C# and MA03-C-N#, respectively.

Map Number: SV-03-310

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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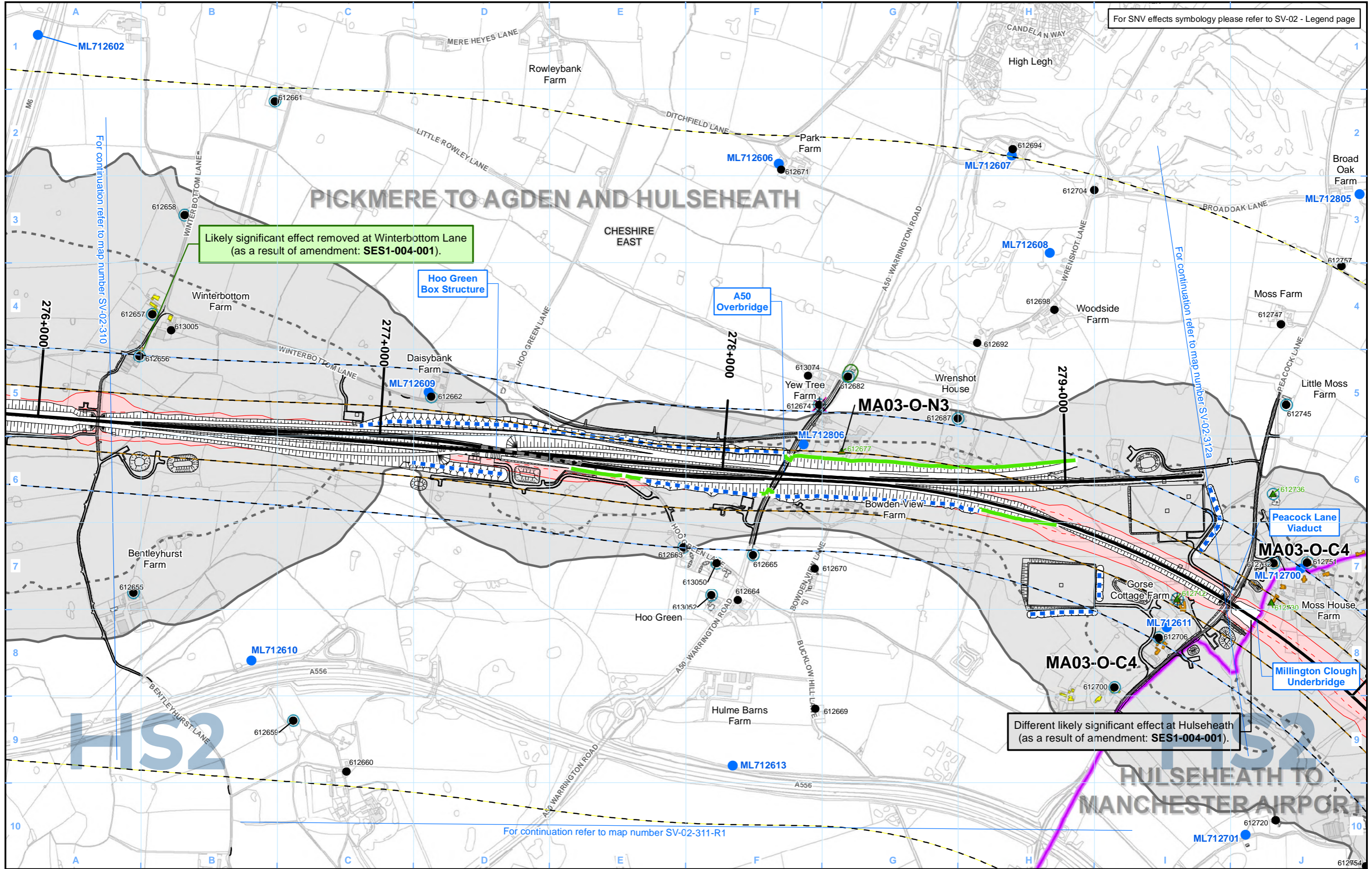
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Date: 19/04/22

PICKMERE TO AGDEN AND HULSEHEATH

Likely significant effect removed at Winterbottom Lane (as a result of amendment: SES1-004-001).

Different likely significant effect at Hulseheath (as a result of amendment: SES1-004-001).



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

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

- Legend - Noise related features**
- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- Noise Important Areas defined in national noise action plans (Defra 2014)
- Committed developments - SV Only
 - Airborne noise study area

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number: SV-02-311

Map Name: Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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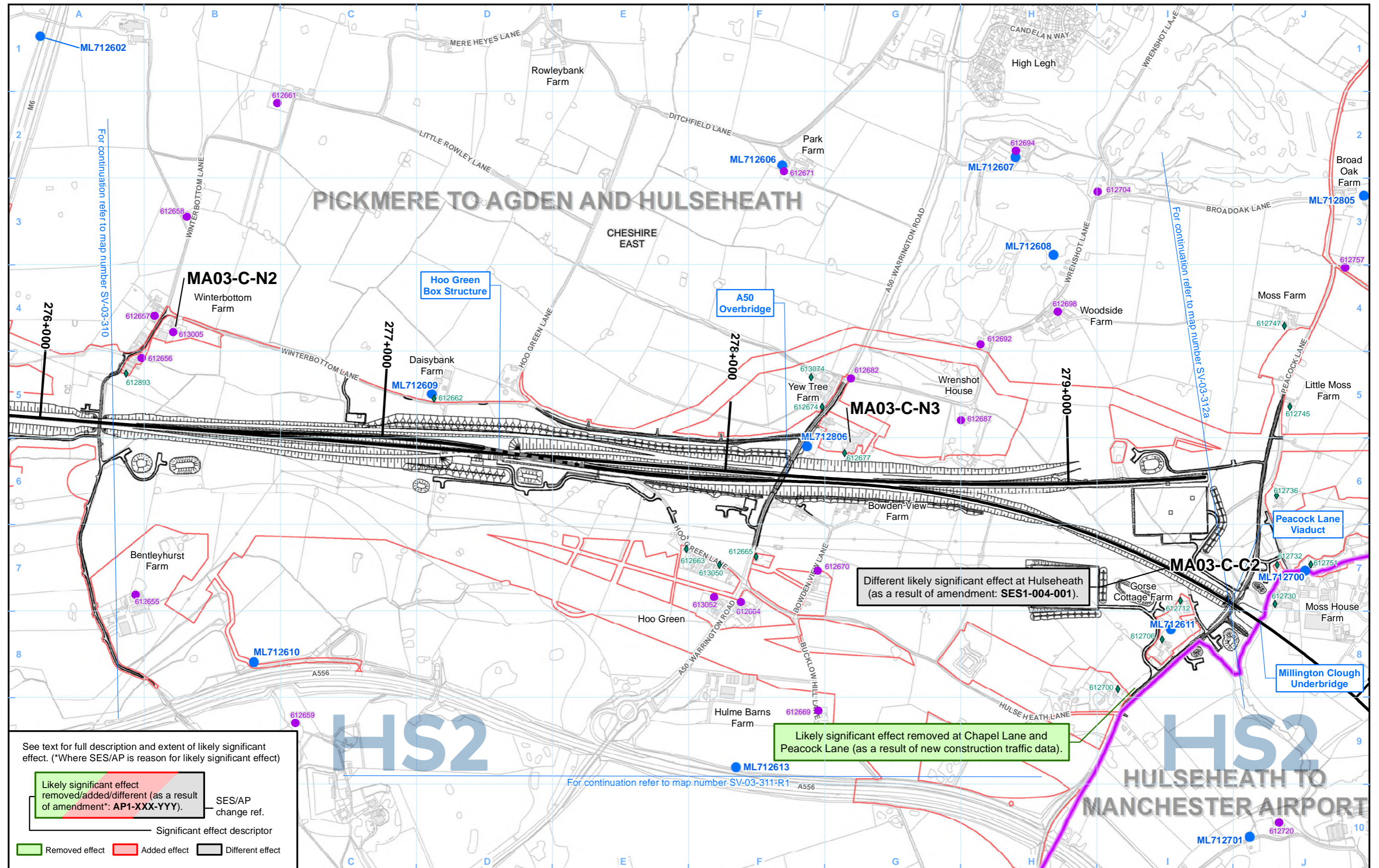
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See text for full description and extent of likely significant effect. (*Where SES/AP is reason for likely significant effect)

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
—	Significant effect descriptor
Removed effect	Added effect
Different effect	

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

- Engineering earthworks:**
- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting
- Land potentially required during construction

- Legend - Sound related features**
- Committed developments - SV Only
 - Construction airborne sound assessment location
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location

labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).

Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA03-C-C# and MA03-C-N#, respectively.

Map Number	SV-03-311
Map Name	Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES
Community Area MA03: Pickmere to Agden and Hulseheath	

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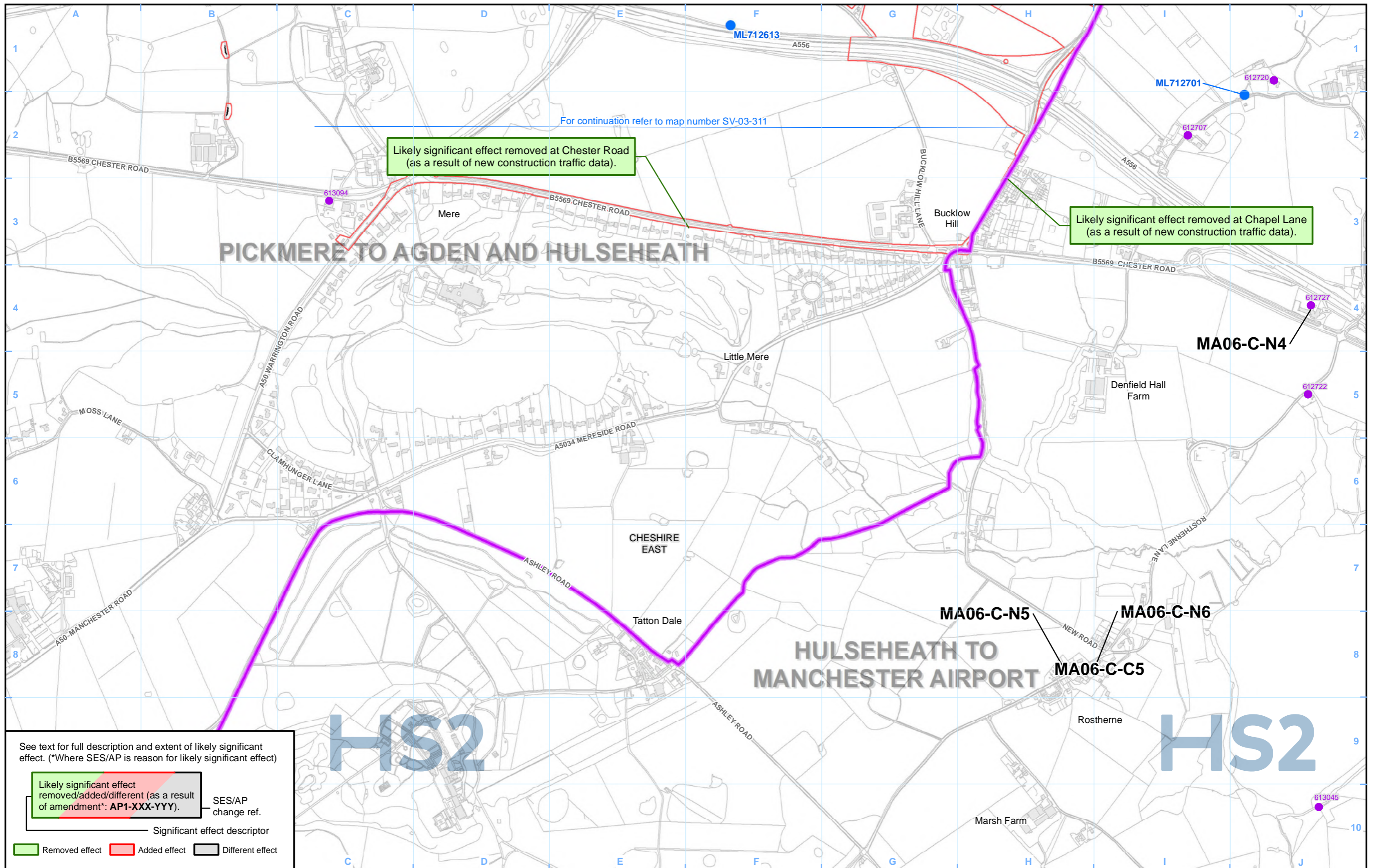
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Date: 19/04/22

Scale at A3: 1:10,000

Metres

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Likely significant effect removed at Chester Road (as a result of new construction traffic data).

Likely significant effect removed at Chapel Lane (as a result of new construction traffic data).

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).	SES/AP change ref.
—	Significant effect descriptor
Removed effect	Added effect
Different effect	

Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary
- Engineering earthworks:
- Embankment
 - Cutting
 - Land potentially required during construction
- Non engineering earthworks:
- Embankment
 - Cutting

Legend - Sound related features

- Committed developments - SV Only
 - Construction airborne sound assessment location
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location
- labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).
- Likely significant effects from construction noise and /or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA03-C-C# and MA03-C-N#, respectively.

Map Number	SV-03-311-R1
Map Name	Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES
	Community Area MA03: Pickmere to Agden and Hulseheath

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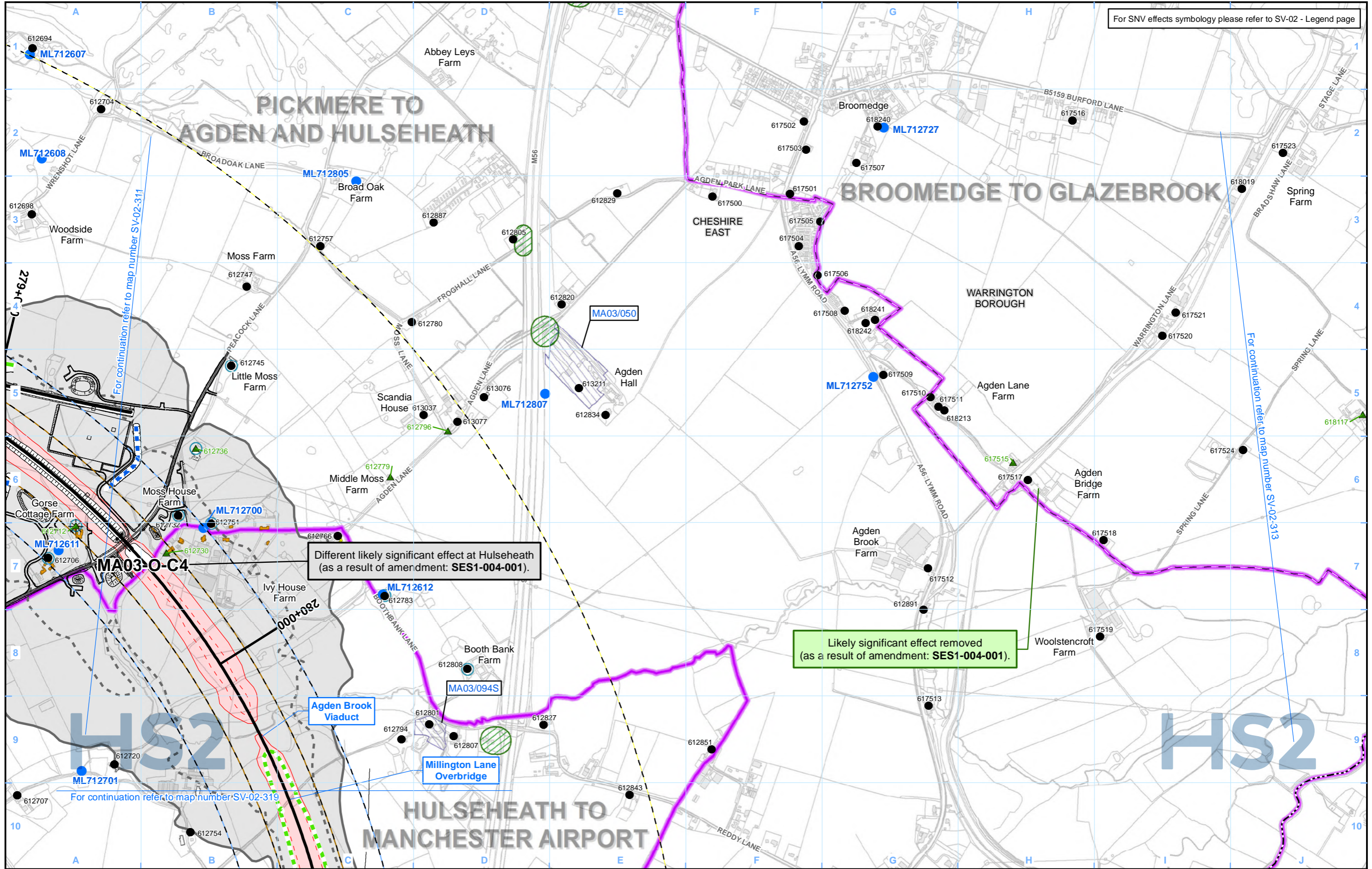
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Different likely significant effect at Hulseheath (as a result of amendment: SES1-004-001).

Likely significant effect removed (as a result of amendment: SES1-004-001).

Legend - General features

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

Engineering earthworks:

- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting

Legend - Noise related features

- Envisaged mitigation to avoid / reduce significant noise effects:
- Landscaping and/or fence barriers (labelled with total noise barrier height above rail)
 - Engineering e.g. cuttings (green tunnels separately marked)
- Envisaged features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings

Legend - Noise related features

- Noise Important Areas defined in national noise action plans (Defra 2014)
- Noise Important Areas defined in national noise action plans (Defra 2014)
 - Committed developments - SV Only
 - Airborne noise study area

Legend - Noise related features

- Ground-borne noise & vibration study area (residential and non-residential)
- Ground-borne noise & vibration study area (highly sensitive non-residential)
- Airborne noise assessment location
- Airborne noise and vibration assessment location
- Ground-borne noise and/or vibration assessment location
- Airborne noise, ground-borne sound and vibration assessment location
- Baseline measurement locations

Map Number SV-02-312a

Map Name

Operational Airborne Noise and Vibration Impacts and Likely Significant Effects SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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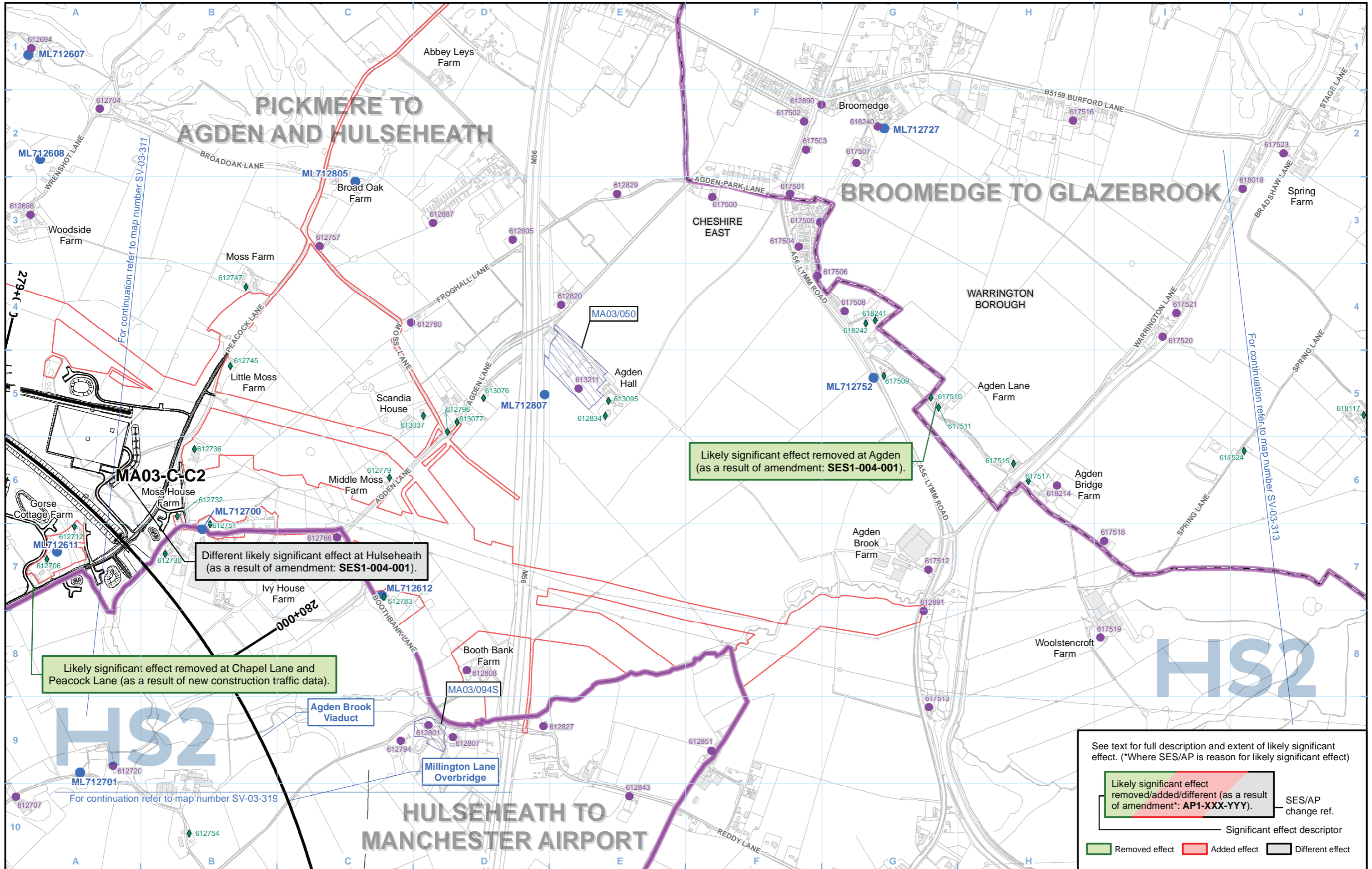
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Scale at A3: 1:10,000

Metres

Date: 19/04/22



Different likely significant effect at Hulseheath (as a result of amendment: SES1-004-001).

Likely significant effect removed at Agden (as a result of amendment: SES1-004-001).

Likely significant effect removed at Chapel Lane and Peacock Lane (as a result of new construction traffic data).

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

Likely significant effect removed/added/different (as a result of amendment*: AP1-XXX-YYY).

SES/AP change ref.

Significant effect descriptor

Removed effect Added effect Different effect

Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough boundary
- Engineering earthworks:**
- Embankment
 - Cutting
- Non engineering earthworks:**
- Embankment
 - Cutting
- Land potentially required during construction

Legend - Sound related features

- Committed developments - SV Only
 - Construction airborne sound assessment location
 - Construction vibration assessment location
 - Construction airborne sound and vibration assessment location
 - Baseline measurement location
- labelled with assessment location ID reference number (for details of the SES/AP1 ES assessment results see Volume 5 Appendix SV-002-00000) (labelled with measurement location reference code).
- Likely significant effects from construction noise and/or vibration on groups of dwellings and any shared community open areas, and non-residential receptors, are indicated by MA03-C-C# and MA03-C-N#, respectively.

Map Number: SV-03-312a

Map Name: Construction Airborne Noise and Vibration Likely Significant Effects SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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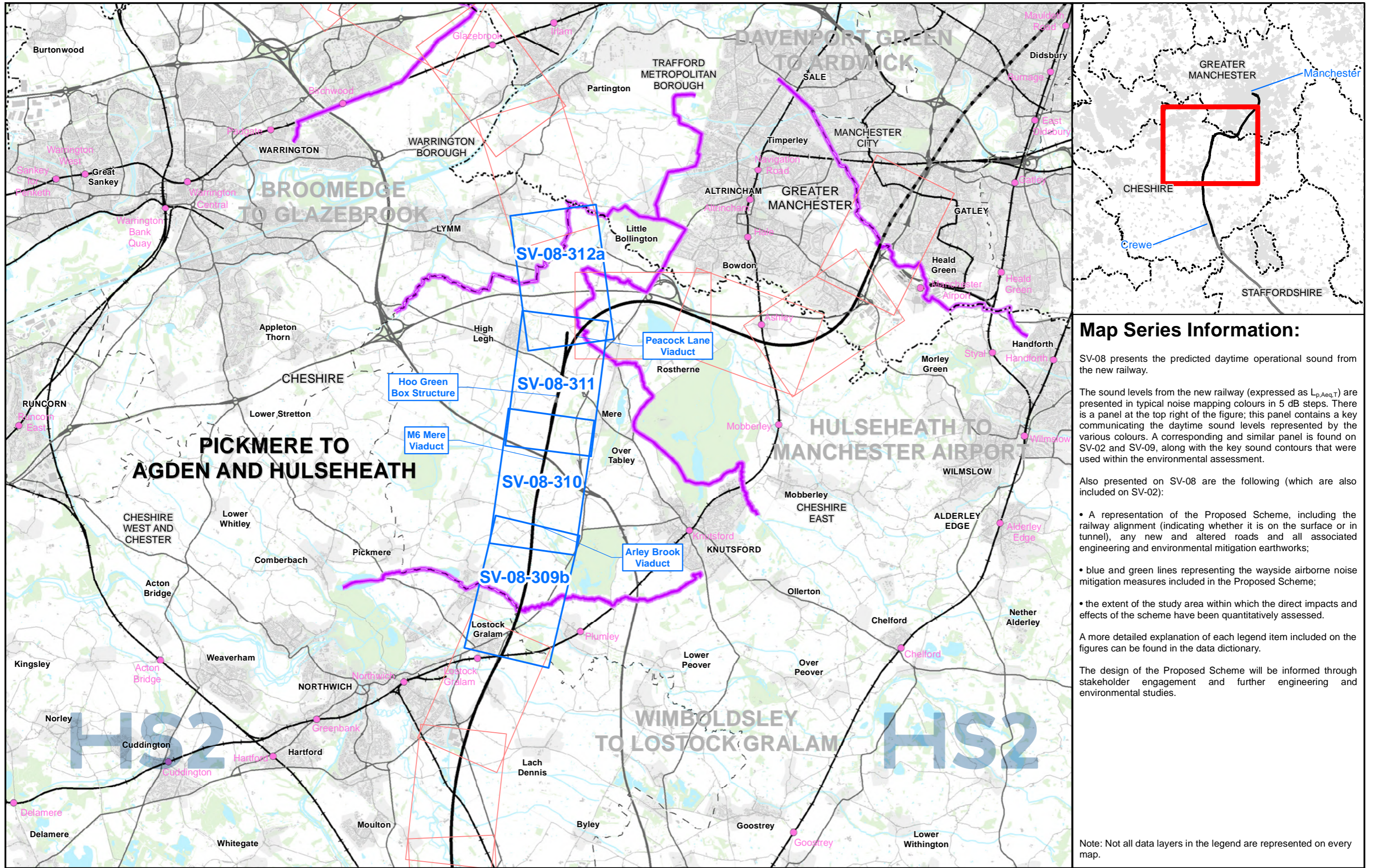
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Doc Number: 2PT24-MWJ-EV-MAP-M000-002061-P01

Date: 19/04/22

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0 100 200 300 400 Metres



Map Series Information:

SV-08 presents the predicted daytime operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{p,Aeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; this panel contains a key communicating the daytime sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-09, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-08 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;
- 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.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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 area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

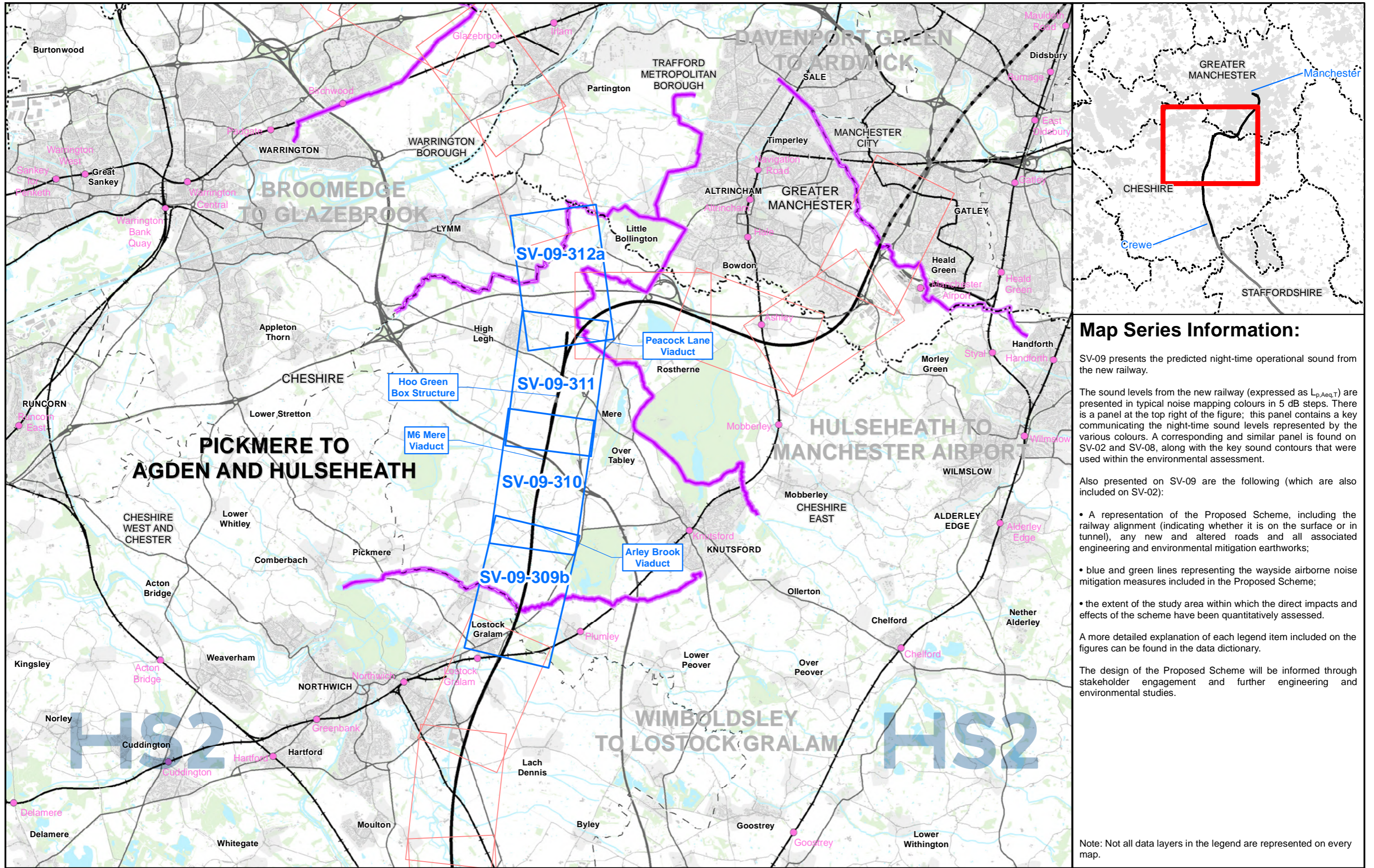
Map Number	SV-08-INDEX-MA03
Map Name	Index Map of: Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA03: Pickmere to Agden and Hulseheath

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Doc Number: 2PT24-MWJ-EV-MAP-M000-003074-P01
Date: 19/04/22



Map Series Information:

SV-09 presents the predicted night-time operational sound from the new railway.

The sound levels from the new railway (expressed as $L_{p,Aeq,T}$) are presented in typical noise mapping colours in 5 dB steps. There is a panel at the top right of the figure; this panel contains a key communicating the night-time sound levels represented by the various colours. A corresponding and similar panel is found on SV-02 and SV-08, along with the key sound contours that were used within the environmental assessment.

Also presented on SV-09 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;
- 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.

The design of the Proposed Scheme will be informed through stakeholder engagement and further engineering and environmental studies.

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 area boundary
	Existing railway station
	County boundary
	District/Borough boundary
	Map sheets included in this community area
	Map sheets included in this community area with no amendment
	Map sheets not included in this community area

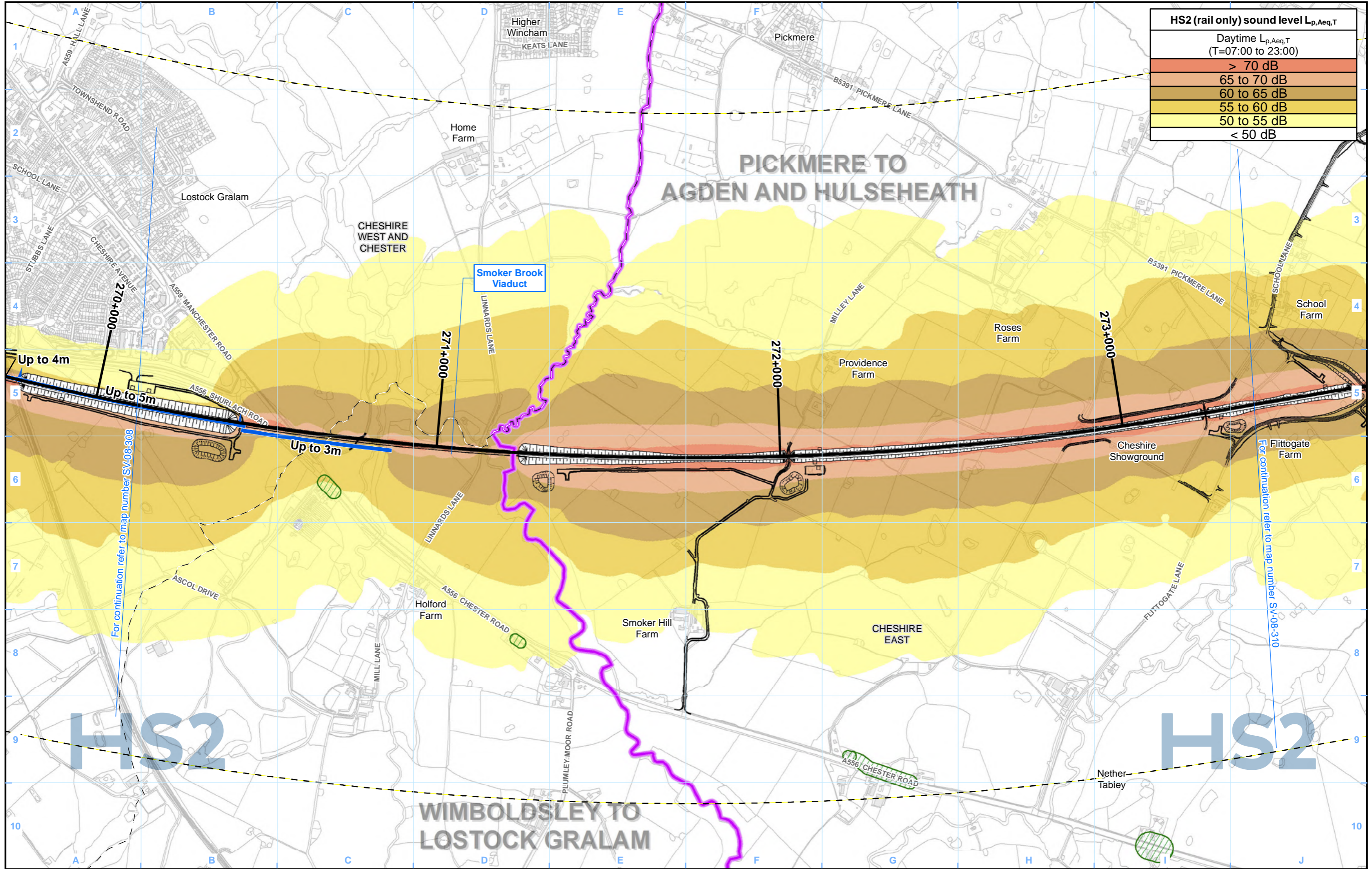
Map Number	SV-09-INDEX-MA03
Map Name	Index Map of: Night-time Operational Sound Contour Maps SES1 and AP1 ES Community Area MA03: Pickmere to Agden and Hulseheath

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Date: 19/04/22



HS2 (rail only) sound level $L_{p,Aeq,T}$	
Daytime $L_{p,Aeq,T}$ (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	50 to 55 dB
	< 50 dB

- Legend - General features**
- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough 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 features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- * Labelled with total barrier height above rail level

- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

Map Number: SV-08-309b

Map Name: Daytime Operational Sound Contour Maps SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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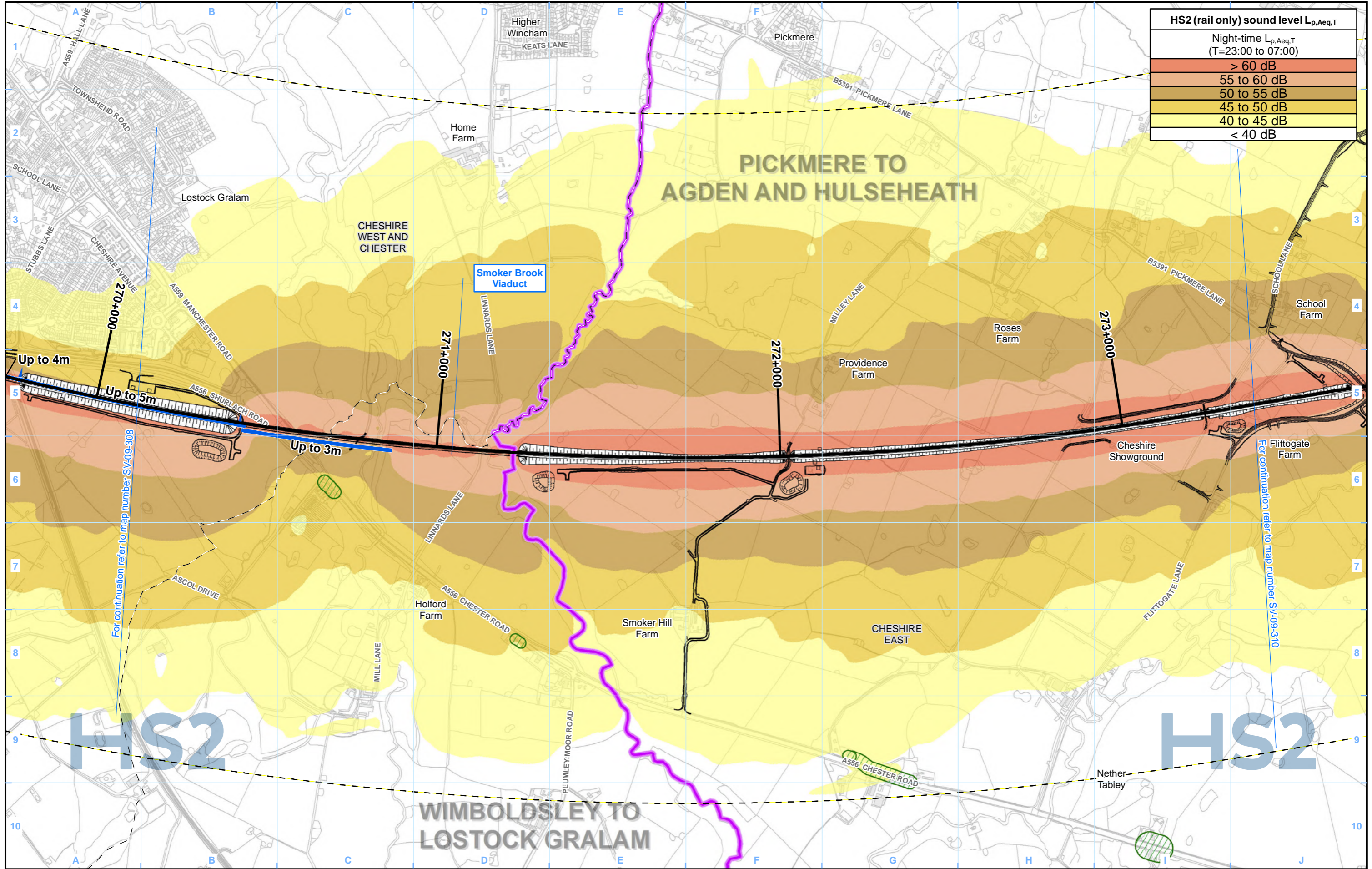
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Scale at A3: 1:10,000

Metres

Date: 19/04/22

HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
	> 60 dB
	55 to 60 dB
	50 to 55 dB
	45 to 50 dB
	40 to 45 dB
	< 40 dB



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:**
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

Legend - Sound related features

- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

- Airborne noise study area
- Noise Important Areas defined in national noise action plans (Defra 2019)

* Labelled with total barrier height above rail level

Map Number	SV-09-309b
Map Name	Night-time Operational Sound Contour Maps SES1 and AP1 ES
	Community Area MA03: Pickmere to Agden and Hulseheath

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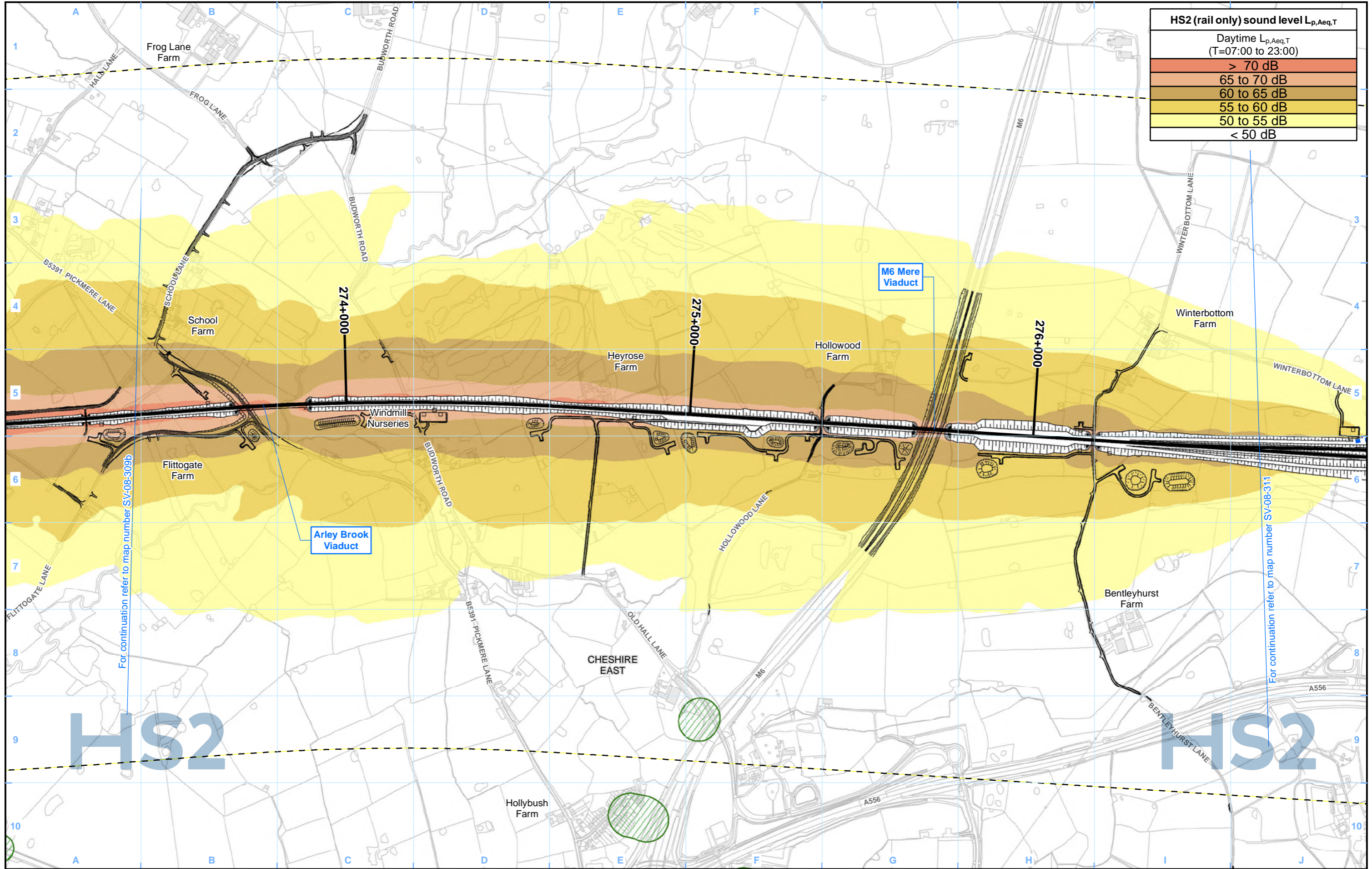
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Metres

Doc Number: 2PT24-MWJ-EV-MAP-M000-003131-P01 **Date:** 19/04/22

HS2 (rail only) sound level $L_{p,Aeq,T}$	
Daytime $L_{p,Aeq,T}$ (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	50 to 55 dB
	< 50 dB



Legend - General features

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

Engineering earthworks:

	Embankment
	Cutting

Non engineering earthworks:

	Embankment
	Cutting

Legend - Sound related features

	Envisaged mitigation to avoid / reduce significant noise effects:		Airborne noise study area
	Landscaping and/or fence barriers*		Noise Important Areas defined in national noise action plans (Defra 2019)
	Engineering e.g. cuttings (green tunnels separately marked)		
Envisaged features further reducing noise effects:			
	Other environmental e.g. landscaping		
	Engineering e.g. cuttings		

* Labelled with total barrier height above rail level

Map Number	SV-08-310
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES
	Community Area MA03: Pickmere to Agden and Hulseheath

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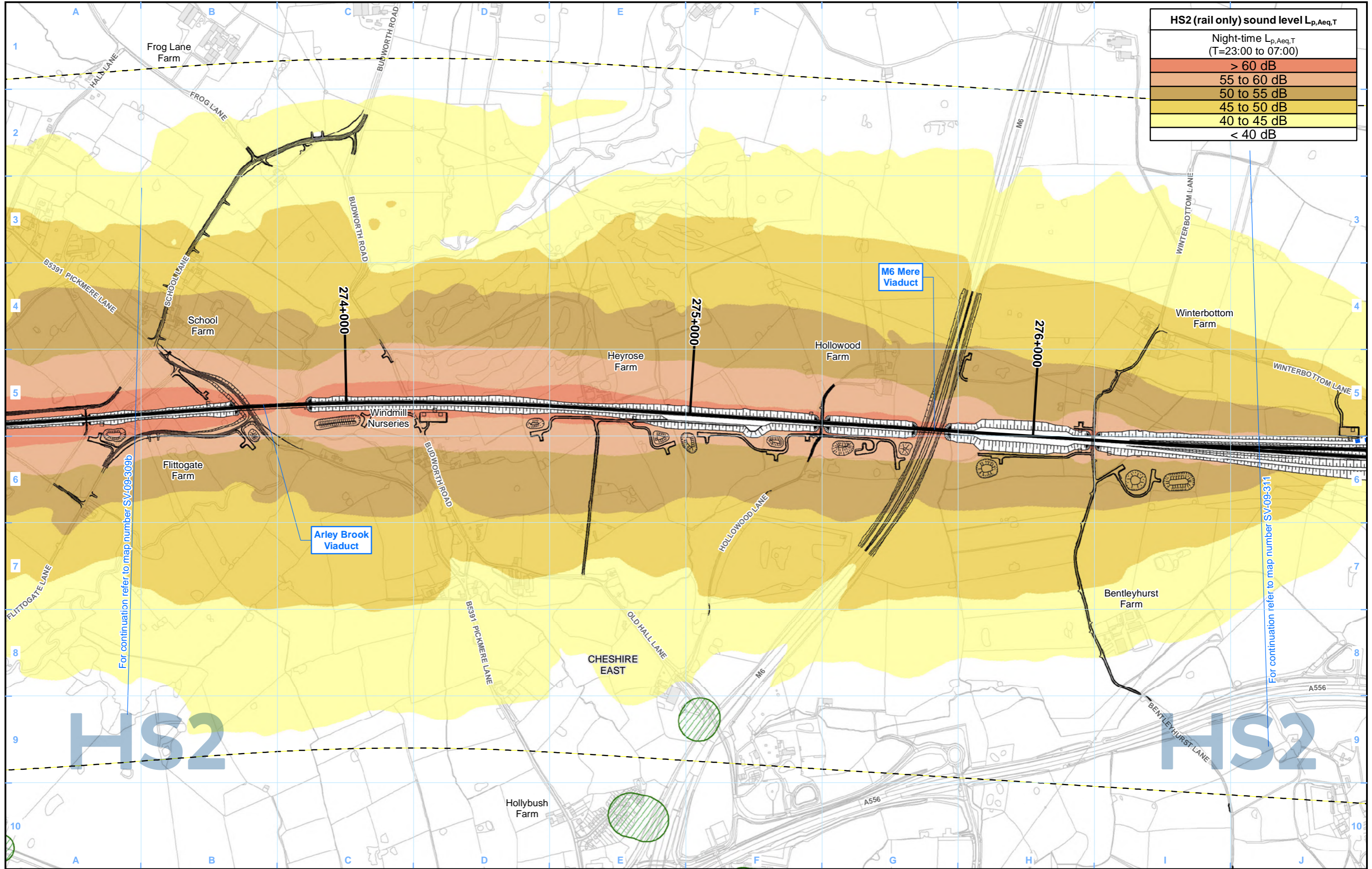
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Scale at A3: 1:10,000

Metres

Date: 19/04/22

HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
> 60 dB	(Dark Red)
55 to 60 dB	(Red)
50 to 55 dB	(Orange)
45 to 50 dB	(Yellow-Orange)
40 to 45 dB	(Yellow)
< 40 dB	(Light Yellow)



For continuation refer to map number SV-09-309b

For continuation refer to map number SV-09-311

Legend - General features

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

Engineering earthworks: 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 features further reducing noise effects:**
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
 - Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)
- * Labelled with total barrier height above rail level

Map Number SV-09-310

Map Name
Night-time Operational Sound Contour Maps
SES1 and AP1 ES
 Community Area MA03:
 Pickmere to Agden and Hulseheath

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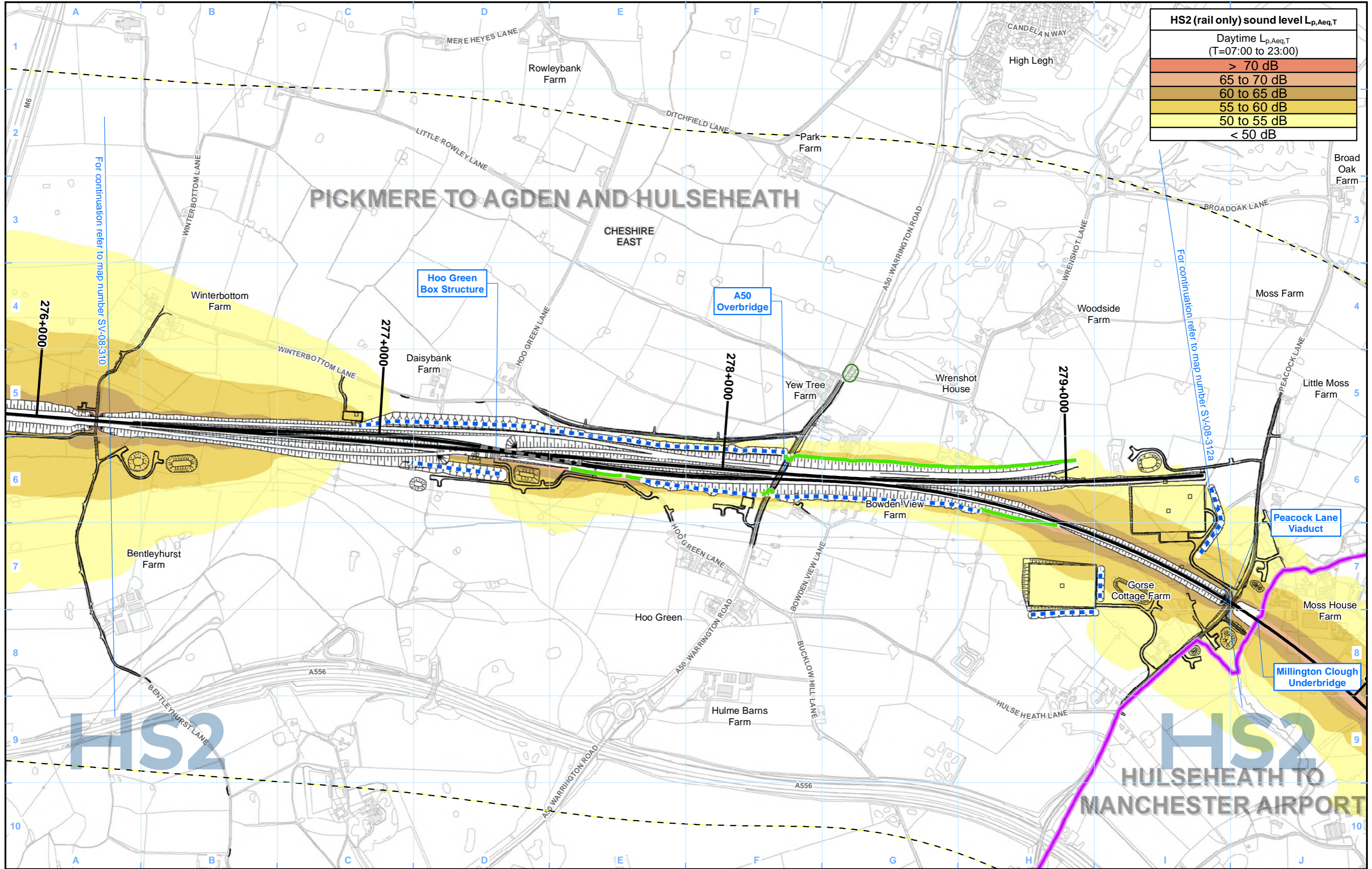
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Date: 19/04/22

HS2 (rail only) sound level L _{p,Aeq,T}	
Daytime L _{p,Aeq,T} (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	50 to 55 dB
	< 50 dB

PICKMERE TO AGDEN AND HULSEHEATH



Legend - General features

- Route in bored tunnel
- Route in green tunnel
- Route on surface
- Depot, station, headhouse or portal building
- Community area boundary
- County boundary
- District/Borough 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 features further reducing noise effects:
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- * Labelled with total barrier height above rail level
- Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)

Map Number	SV-08-311
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES
	Community Area MA03: Pickmere to Agden and Hulseheath

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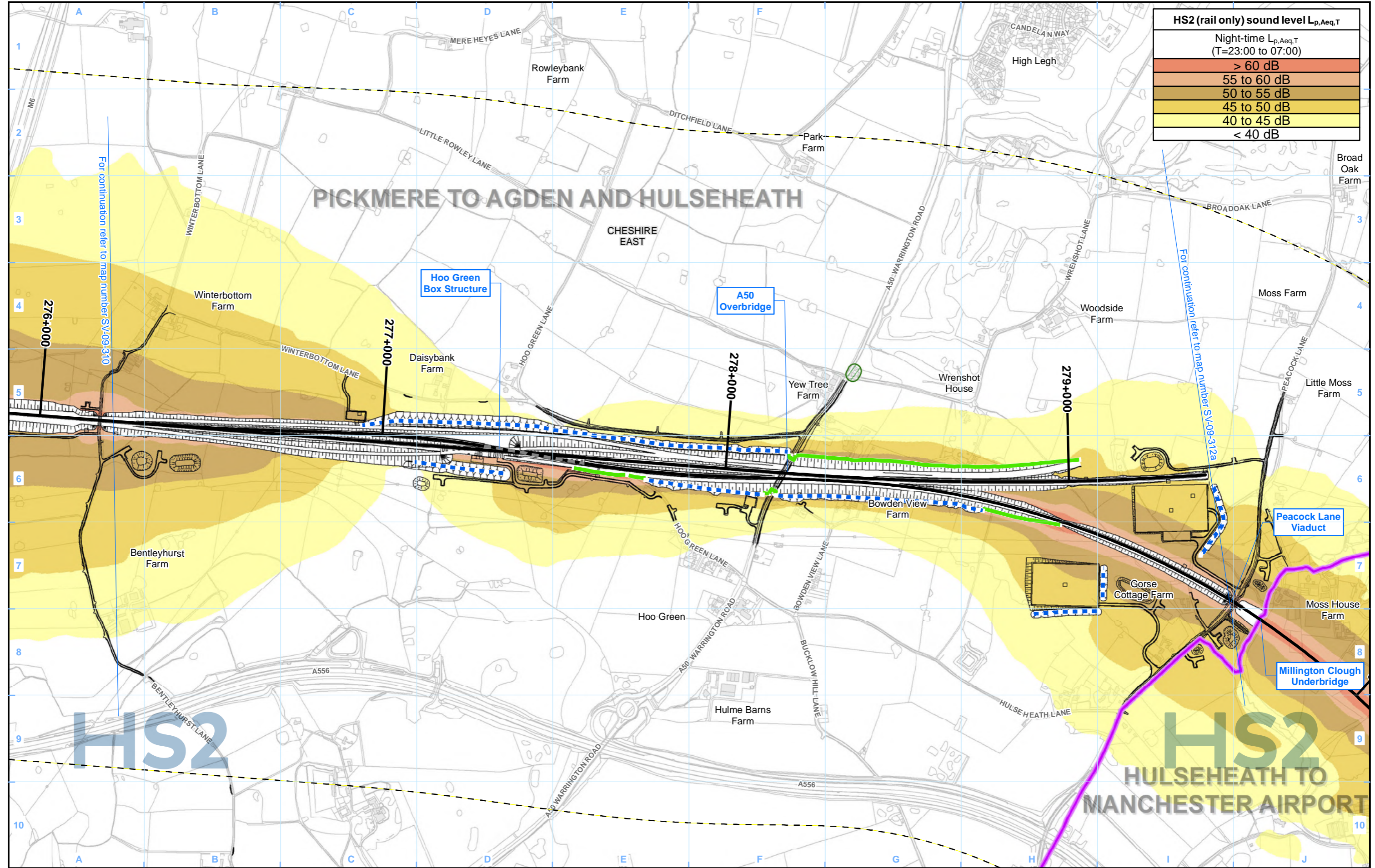
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Scale at A3: 1:10,000

Metres

Date: 19/04/22

HS2 (rail only) sound level L _{p,Aeq,T}	
Night-time L _{p,Aeq,T} (T=23:00 to 07:00)	
	> 60 dB
	55 to 60 dB
	50 to 55 dB
	45 to 50 dB
	40 to 45 dB
	< 40 dB



Legend - General features

- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough 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)
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- Envisaged features further reducing noise effects:**
- Other environmental e.g. landscaping
 - Engineering e.g. cuttings
- * Labelled with total barrier height above rail level
- Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)

Map Number	SV-09-311
Map Name	Night-time Operational Sound Contour Maps SES1 and AP1 ES
	Community Area MA03: Pickmere to Agden and Hulseheath

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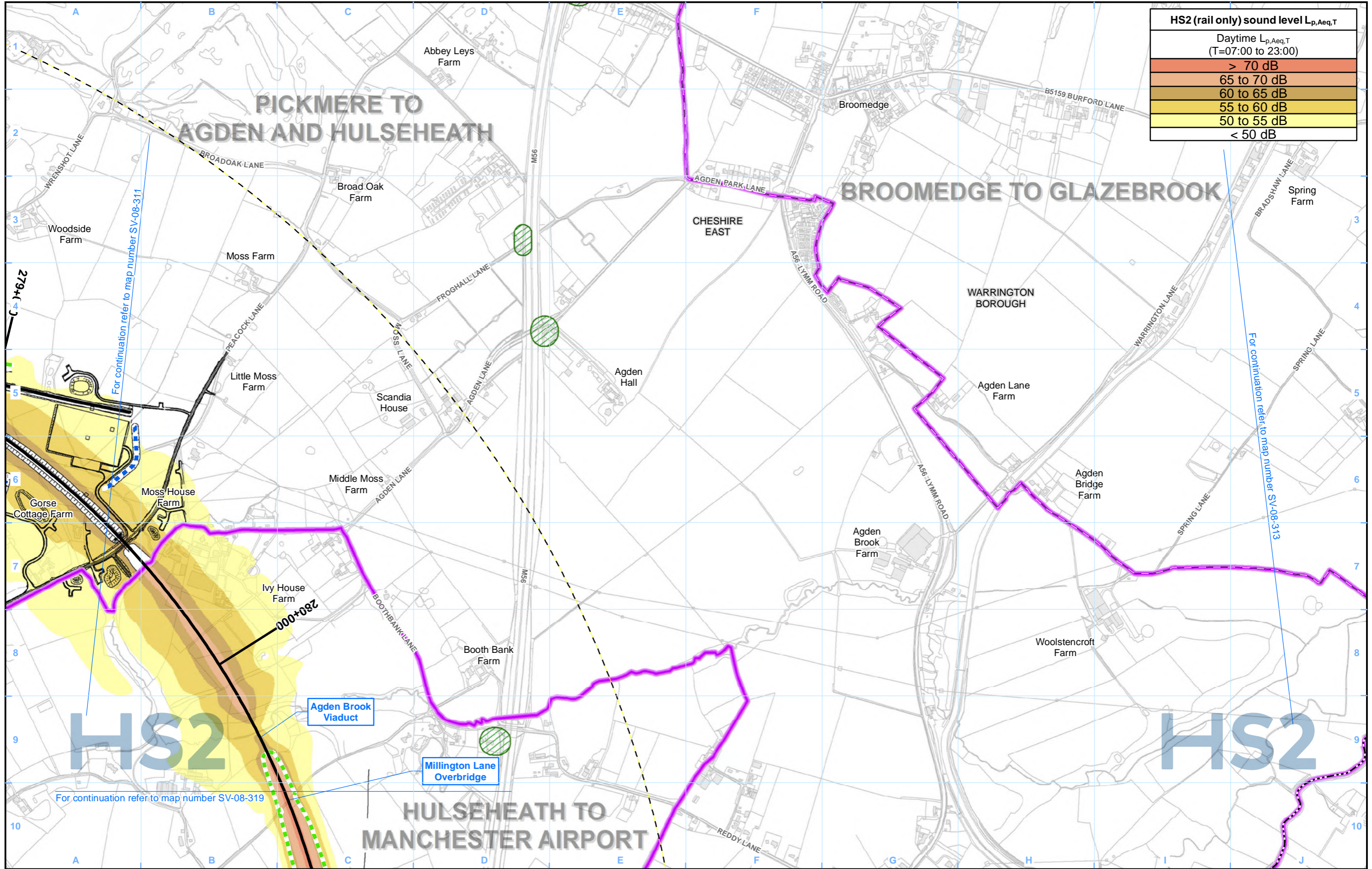
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Date: 19/04/22



HS2 (rail only) sound level $L_{p,Aeq,T}$	
Daytime $L_{p,Aeq,T}$ (T=07:00 to 23:00)	
	> 70 dB
	65 to 70 dB
	60 to 65 dB
	55 to 60 dB
	50 to 55 dB
	< 50 dB

- Legend - General features**
- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough 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 features further reducing noise effects:
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)
- * Labelled with total barrier height above rail level

Map Number	SV-08-312a
Map Name	Daytime Operational Sound Contour Maps SES1 and AP1 ES Community Area MA03: Pickmere to Agden and Hulseheath

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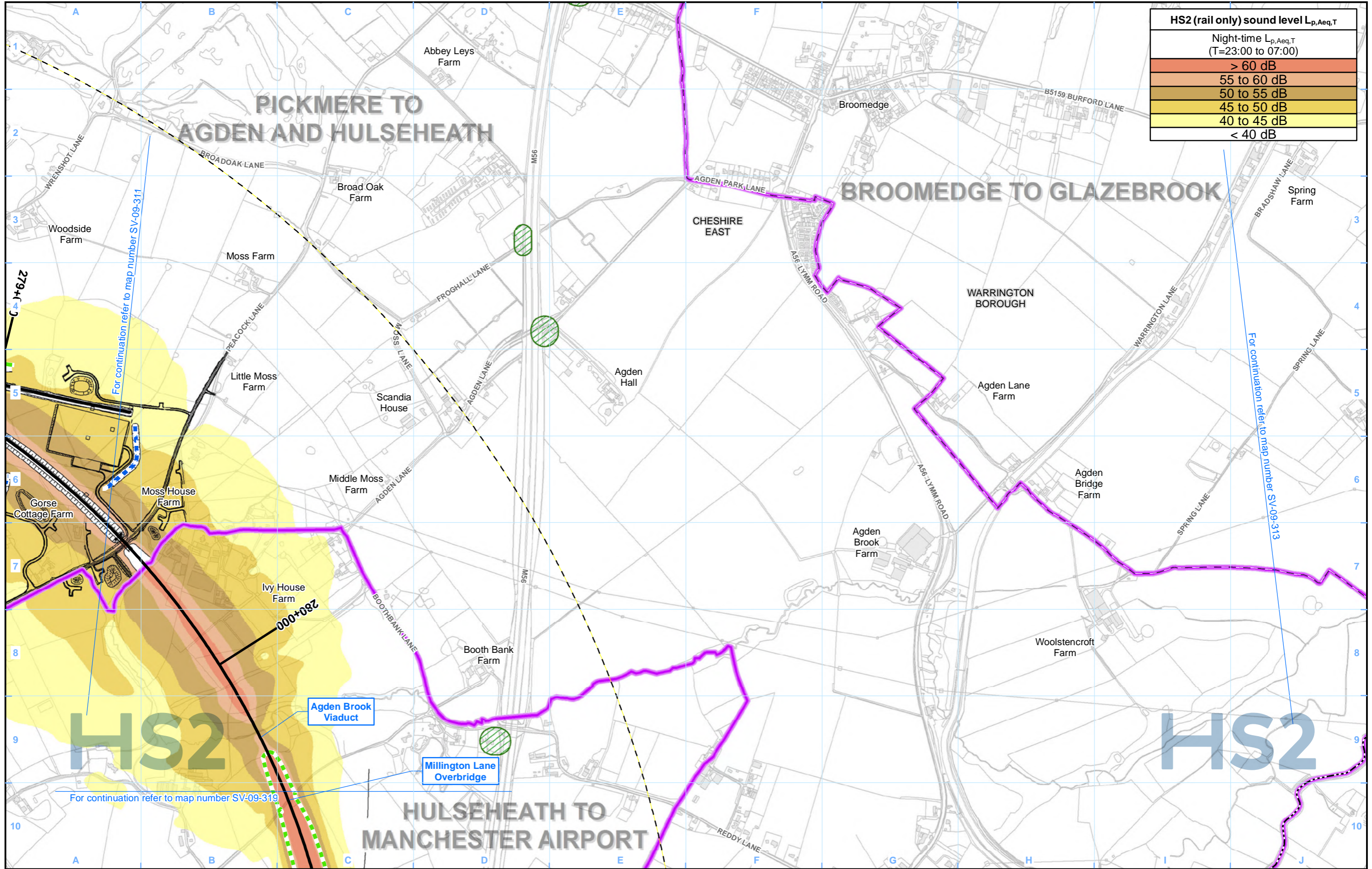
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Date: 19/04/22



HS2 (rail only) sound level $L_{p,Aeq,T}$	
Night-time $L_{p,Aeq,T}$ (T=23:00 to 07:00)	
	> 60 dB
	55 to 60 dB
	50 to 55 dB
	45 to 50 dB
	40 to 45 dB
	< 40 dB

- Legend - General features**
- Route in bored tunnel
 - Route in green tunnel
 - Route on surface
 - Depot, station, headhouse or portal building
 - Community area boundary
 - County boundary
 - District/Borough 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 features further reducing noise effects:**
 - Other environmental e.g. landscaping
 - Engineering e.g. cuttings

- Airborne noise study area
 - Noise Important Areas defined in national noise action plans (Defra 2019)
- * Labelled with total barrier height above rail level

Map Number: SV-09-312a

Map Name: Night-time Operational Sound Contour Maps SES1 and AP1 ES

Community Area MA03: Pickmere to Agden and Hulseheath

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